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# COMMISSIONER OF PUBLIC HEALTH

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## WESTERN AUSTRALIA

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### REPORT FOR THE YEAR 1958

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REPORT  
OF THE  
*Commissioner of Public Health*  
*for the year 1958*

Presented to both Houses of Parliament



*The Honourable Emil Nulsen, M.L.A.,*  
**MINISTER FOR HEALTH**



Sir,

I have the honour to submit the Report of the  
Department of Public Health for the Year 1958.

*LINLEY HENZELL, M.D. (London), B.Sc., D.P.H.,*  
*Commissioner of Public Health.*



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# DEPARTMENT OF PUBLIC HEALTH

## Report of the Commissioner

TO THE HONOURABLE THE MINISTER FOR HEALTH

I have the honour to submit the report of the Department of Public Health for the year 1958.

There was an increase in the population during the year from 691,723 to 705,600—an increase of 13,877 or 2·01 per cent.

The birth rate was slightly lower—23·71 per 1,000 of mean population, compared with 24·47 for the previous year.

The death rate was slightly higher, having increased from 7·66 to 7·87 per 1,000 of the population, but was still lower than that of any other Australian State or New Zealand.

The natural increase in population (excess births over deaths) was therefore 1·58 per cent. (The world average is 1·6 per cent.)

There was a fall in the maternal mortality rate to 0·48 per 1,000 live births, the lowest yet recorded in the State. However, this is still too high in comparison with other countries with a comparable standard of living and continued efforts will be made to reduce it.

The infant mortality rate was practically unaltered, being 21·52 per 1,000 live births.

Thus the vital statistics of the State continue to be satisfactory. (See Appendix I.)

### STATE HEALTH COUNCIL

Four meetings of the State Health Council were held during the year. Committees of the Council held meetings as follows :—

Hospital Requirements Committee—3 meetings.

Maternal and Infant Health—2 meetings.

Mental Health Committee—1 meeting.

The composition of the Council was as follows :—

One senior representative of the Royal College of Physicians—Dr. Ernest R. Beech.

One senior representative of the Royal College of Surgeons—Mr. Norman Robinson.

One senior representative of the Royal College of Obstetricians and Gynaecologists—Dr. Roland Nattrass.

Four medical practitioners, nominated by the British Medical Association (at least one to represent country districts)—Dr. Dixie M. Clement, Dr. H. Leigh Cook, Dr. Ian O. Thorburn, Dr. Martin F. Williams.

Three representatives of the Faculty of Medicine of the University of Western Australia—Professor Gordon King, Professor C. W. D. Lewis, Professor Eric G. Saint.

The Professor of Child Health, University of Western Australia—Professor W. B. Macdonald.

Inspector-General of Mental Services—Dr. D. W. Moynagh.

The Commissioner of Public Health—Dr. Linley Henzell.

The Deputy Commissioner of Public Health—Dr. W. S. Davidson.

The Under Secretary—Mr. J. J. Devereux.

The following were among matters considered by Council :—

*Hypnosis.*—The use of hypnosis in medical treatment and its increasing popularity as a stage entertainment were discussed.

It was considered that there was insufficient evidence concerning the dangers associated with stage performances to warrant recommending legislation to control it.

The matter is receiving further consideration and it is understood will be referred to the National Health and Medical Research Council.

*Hospital Construction.*—The Hospital Requirements Committee and, through it, the Council, kept under constant revision the hospital construction programme.

Considerable attention was given to the need for the provision of beds for geriatric cases.

*Radiation in Pregnancy.*—Recommendations concerning the significance of radiation risks in pregnancy and their control were prepared by the Honorary Medical Staff of the King Edward Memorial Hospital for Women and circulated to all medical practitioners.

*Maternal Mortality.*—The procedure involving any enquiries into maternal deaths as laid down in the Health Act, was reviewed. It was agreed that further consideration of this should be deferred until next year on the return of Dr. Snow from his visit to the United States.

*Drug Addiction.*—It was recommended that drug addiction be made a notifiable condition under the Health Act. It was also recommended that all patients who have been receiving certain scheduled narcotic drugs for a period of two months on prescription by medical practitioners be notified to the Commissioner of Public Health, and that an advisory panel be set up to advise concerning their future management.

*Medical Appliances and Drugs Advertised for Sale.*—It was recommended that legislation be inaugurated to provide for the prohibition and control of the sale of any drugs or medicine, medical appliance, dressing, toilet preparation, or cosmetic preparation for which a physiological effect is claimed, if it is either dangerous or harmful to health or deficient in its composition.

*University Medical Centre.*—The Council, on the advice of the Hospital Requirements Committee, recommended that early steps be taken to proceed with the construction of Winthrop Avenue and the closure of University Avenue to allow for the development of the University Medical Centre.

It was also recommended that a Planning Officer be appointed to integrate and supervise the planning of the projected University Hospital at the Centre.

As in previous years the members of the State Health Council and its Committees gave many hours of their time in an honorary capacity to afford the State Government the value of their professional advice. Their services are gratefully appreciated.

#### LOCAL AUTHORITIES

During the year meetings were called to bring together the Local Authorities in the metropolitan area in order to form proposals for the pooling of their resources to achieve a more economic and satisfactory method of disposal of rubbish.

A committee was formed representative of the Public Health Department, Local Health Authorities, Town Planning Department and the Metropolitan Water Supply, Sewerage and Drainage Department.

A proposal for the zoning of the metropolitan area and the grouping of Local Authorities as constituent members of the various zones was prepared and approved in principle by the Local Authorities, and the working out of further details is proceeding.

Efforts are continuing to ensure that every Local Authority in the State will receive the services of a health inspector either whole time or part time.

#### FOOD AND INSPECTORIAL STAFF

See Appendix XVIII for the report of the Chief Inspector, Mr. C. E. Flower.

The burden of work on the Health inspectorial staff continues to be heavy. It is their responsibility to supervise work of the inspectors appointed by Local Authorities, of which there are 147. This work is rendered easier by the good relationships which exist between the Department's staff and those of the Local Authorities, but the demands on their time are more than can be adequately fulfilled by the numbers available.

Work continued on the registration of pesticides under new Pesticide Regulations. The total number of pesticides registered up to the end of the year was 765, of which 139 were new products approved in the course of the year.

The Annual Health Inspectors' Conference was held in September. It is proposed to continue this as an annual event as it affords an opportunity to bring together inspectors from all over the State.

#### HEALTH OF THE NATIVE POPULATION

Dr. Davidson continues his outstanding work in the control of leprosy in the aboriginal population (see Appendix XI).

In order to facilitate the leprosy programme and to control more effectively the health of natives, Dr. J. J. Elphinstone was appointed to the staff in April.

Dr. Davidson outlines the progress which is being made. Two significant factors emerge. Firstly, the natives now seek treatment when they suspect that they might be suffering from the disease—an attitude in marked contrast to their former one when they would "go bush" when they knew a Medical Officer was nearing their presence to examine them. Secondly, the number of patients receiving treatment in the Leprosarium at Derby has fallen from 333 in 1951 to 150 at the end of 1958; now, discharges exceed admissions. The leprosy control campaign is to be vigorously pursued.

A tribute must be paid to the devotion of the Sisters of St. John of God, who are responsible for the nursing care of the patients in the Leprosarium.

The trachoma campaign will be reported on elsewhere in this report. This is a significant public health problem in our aboriginal population.

#### PUBLIC HEALTH LABORATORIES

In September, 1958, the Perth Chest Hospital was opened. The Public Health Laboratories which had been formerly situated in the Royal Perth Hospital were then transferred to their headquarters in the new laboratories in the Perth Chest Hospital, where they undertook the laboratory work of that hospital in addition to their usual public health responsibilities.

Pending the arrival of a new Director of Laboratory Services (expected early in January, 1959), Dr. Kovacs continued to be responsible for the Laboratories' activities. His annual report is attached—see Appendix II.

Now that the Public Health Laboratories are at last occupying a home of their own, it is expected that they will be in a position to offer more extensive facilities in the control of public health problems of the State, in spite of their limited floor space.

Dr. Kovacs continued his work on the Salmonellae and the frequency in which these organisms are detected in foodstuffs is causing some concern. In addition, examinations of fertilisers of animal origin (blood and bone, meatmeal, etc.) have shown the occurrence of enteric pathogens too frequently.

Work is to be undertaken concerning the relationship between this widespread occurrence in specimens examined and the incidence of salmonellosis in the human population. It is considered that this group of organisms is responsible for a considerable amount of illness and absenteeism from work every year.

Enquiries are continuing into the treatment of eggpulp. Of 1,022 specimens examined in the year, 378 showed the presence of salmonellae. It is interesting to note that *S. pullorum* was present in 22 per cent.

In an examination of the mesenteric glands of animals slaughtered in the abattoirs, 30·5 per cent. showed the presence of salmonellae.

Dr. Kovacs' report contains particulars of the bacteriology performed for the Royal Perth Hospital until the transfer was made to the Chest Hospital. This will not be shown in future years.

Overall, there was an increase in the laboratory turnover of specimens of approximately 10 per cent.

*Mycobacteria*.—Some concern has been caused by the increase in the number of patients who now excrete anonymous atypical mycobacteria. These organisms produce clinical disease apparently indistinguishable from pulmonary tuberculosis, yet the causative organism is insensitive to the chemotherapeutic agents commonly used in the control of tuberculosis. This atypical group now comprises about 13 per cent. of the total number of positive sputum cases. The position is to be closely watched in collaboration with laboratories in other States.

Dr. Kovacs writes at some length on the laboratory aspect of the identification of *S. typhi* in the sea-water at City Beach. This matter will be dealt with further in the report of the Director of Epidemiology, Dr. Snow.

Mr. Drummond, Technical Officer, Serology Section, reports that there has been an overall increase in the number of serology examinations from 24,608 to 27,162.

During the year a survey was made of dairy farmers in the South-West for leptospirosis. A further comment on this survey will be found in the report issued by Dr. Snow (see Appendix VIII).

The Bunbury Branch of the Public Health Laboratories has continued to expand its work according to the demands made on it by the local doctors in the district. It is pleasing to record the satisfaction that is expressed by these doctors of the service which is given.

In the course of the year the laboratory premises vacated when the tuberculosis laboratory section of the Branch moved from the Perth Chest Clinic to the Perth Chest Hospital, has allowed of the development therein of a virus laboratory. At the end of the year this was formed and offered every prospect that it would provide a valuable adjunct to the laboratory service.

#### TUBERCULOSIS CONTROL BRANCH

In his report, Appendix III, the Director of the Tuberculosis Control Branch, Dr. Alan King, comments on the fact that the death rate from tuberculosis for 1958 was 3·4 per 100,000 of the population. This was easily the lowest figure ever recorded, the nearest being 5 per cent. in 1955.

As was anticipated, the disease is now producing a much lessened impact on the younger age groups. In the year, there were only four deaths from pulmonary tuberculosis in the under 50 age group and seven in the age group 50 to 59. In the course of the year, the number of sufferers from pulmonary tuberculosis on the Case Register dropped to 2,726. Of the 557 cases removed from the Case Register during the year, 343 were considered to have been bacteriologically negative for a sufficiently lengthy period to be regarded as cured.

A total of 168,853 micro radiographs of the chest and 11,800 17 x 14 films were taken at the Perth Chest Clinic.

When the mass X-Ray campaign commenced in 1952, 2·4 cases of significant pulmonary tuberculosis were detected in every thousand persons examined. This figure has progressively fallen and is now 0·7. There can be no doubt that the vigorous campaign undertaken by the Branch has produced this result.

The event of the year was the long awaited opening of the Perth Chest Hospital, which ceremony was performed on 1st September by the Premier, the Hon. A. R. G. Hawke, in the presence of the Federal Minister for Health, Dr. the Hon. D. A. Cameron.

Dr. Heymanson, Tuberculosis Physician, was absent on post-graduate study leave for most of the previous year. On his return he has commenced to develop important work on the estimation of pulmonary physiology, his headquarters for this being in a laboratory at the Perth Chest Hospital. It is anticipated that this will effect a significant advance in the assessment of cases for treatment and be of great value to the clinicians and to the patients. His report on the activities of the Perth Chest Clinic is contained in Appendix V.

In Appendix VI, Dr. Elphick, Medical Superintendent of Wooroloo Sanatorium until his transfer to the Chest Hospital in September, reviews the improvements which have taken place in the treatment of the disease in the past few years. Surgery is being replaced by drug treatment but care will have to be exercised because of the emergence of a significant number of insensitive organisms. However, the clinicians are well aware of this danger and are aware of its clinical and epidemiological implications.

#### COMMUNICABLE DISEASES

The report of the Director of Epidemiology, Dr. Snow, is contained in Appendix VIII.

The major project of this branch of the Department during the year was the continuation of the Poliomyelitis Immunisation Campaign. The vaccination of practically all the children in the State was completed by May and adult vaccination was commenced in the same month. The response to vaccination

on the part of adults has not been as ready and as full as was the response in children. However, it is trusted that by publicity and education, the adult population will submit themselves to vaccination in such numbers that an almost completely immune population will be produced.

The success of this Salk vaccination has been outstanding as a reference to Dr. Snow's report will show. Paralytic poliomyelitis has been virtually eliminated from the community.

Up until the end of 1958, 228,000 people had received three injections of Salk vaccine ; 101,000 had received two injections, and 125,000 had received one injection—a total of 455,000 injections. Further, the record system is so efficient that in a matter of minutes it is possible to obtain information of the date of immunisation of any person in the State, and the batch numbers of the vaccine used.

Dr. Snow comments on an outbreak of typhoid fever which occurred in the early part of the year. Of 15 cases notified, 10 were associated with City Beach. The relationship of the sewage outfall in the neighbourhood of the Beach is discussed by Dr. Snow and also by Dr. Kovacs in his report. Following on the association between these cases and the Beach, the Metropolitan Water Supply, Sewerage and Drainage Department commenced the chlorination of effluent before discharge into the ocean. It was not until this had been effectively in force that the Beach was declared fit for swimming.

If has been known for some time that in the South-Western part of the State a bovine disease (icterohaemoglobinuria or "red-water" fever) occurred in cattle. This disease is communicable to man. It was also known that some human cases of this leptospirosis had occurred in the State. A pilot serological survey was therefore carried out in dairy farmers and in stock and Dr. Snow gives the results of these enquiries in his report. He shows that there is a significant amount of infection in cattle in the South-Western part of the State and also in the corresponding farm personnel, butchers and slaughtermen.

#### VENEREAL DISEASES

In his report, Appendix IX, Dr. Debney comments on the fact that the number of cases of venereal disease notified during the year showed a decrease of 30 per cent. on the previous year and was the lowest since 1944. There can be no doubt that notification is incomplete however, and that these figures do not represent an accurate appraisal of the position.

Dr. Debney comments on the fact that in Britain and the United States of America some strains of gonococci are developing a resistance to penicillin, although this has not as yet been observed in this State. The position is being closely watched.

Representations are being made to the Board of Management of the Royal Perth Hospital to ensure that the Clinic premises receive a long overdue renovation.

#### LIBRARY

The report of the Librarian, Dr. Woolcott, is contained in Appendix XIII.

A good library service is indispensable in the efficient functioning of a public health department. The library has continued this essential work and an indication of its operations is shown by the fact that it receives 314 separate journals, which are available to the various branches of the Department, to the Medical Library of Western Australia at the Medical School, and to ancillary services.

There are 33 sub-libraries extending from Wyndham to Albany.

The headquarters for this library service are contained in one small room in the Public Health Department. The gross overcrowding renders efficient work very difficult and Dr. Woolcott and his Assistant Miss Woods, are to be commended for their efforts under these trying conditions.

#### MATERNAL HEALTH

Eight women died in child birth or as a result of complications associated with child birth or pregnancy in the course of the year.

There were 16,731 births registered in the year and the maternal death rate was 0.48 per 1,000 live births.

Although there has been a decline in maternal mortality in recent years, the figure is still too high as some of these deaths should be preventable.

The Maternal and Infant Health Committee of the State Health Council is actively concerned with this problem, and Professor Gordon King is co-operating.

#### INFANT HEALTH

The report of Dr. Elizabeth Gibson, Medical Supervisor of Infant Health, is contained in Appendix XIV.

The infant mortality rate has not varied appreciably, being 21.52 per 1,000 live births.

Seventy-three per cent. of all babies born in this State attend Infant Health Centres. The Correspondence Section sends enquiries to mothers of all the infants born in inaccessible parts, and the response to these communications has risen to 58 per cent. This is considered to be very satisfactory in the circumstances.

Twenty-seven thousand six hundred and sixty-three individual babies attended the centres during the year, the gross attendance being 218,134. There were 23,330 visits paid to homes ; 361 advices were sent by letter and 6,999 by telephone. These latter services are increasing in number.

At the end of the year there were in use in the State 111 Infant Health buildings, which are considered to be of a satisfactory standard. New buildings were opened at 15 centres. Extensive renovations were made to two. There were four under construction at the end of the year.

Visits have been renewed to Allawah Grove, which is being used as a native housing settlement.

With the assistance of the Health Education Council, another teaching film on educational diet entitled "Dinner Time" was made by the Correspondence and Pre-School Sisters for the education of aboriginal women. The difficult task of teaching coloured mothers the rudiments of baby care in the conditions under which they are living is being tackled with energy and imagination by the Section.

The attendances of expectant mothers at the Mothercraft classes have doubled in the year. Parentcraft classes were also held at night and a total of 150 expectant parents attended. It is found that the interest and the co-operation of the fathers is readily obtained.

Classes continued to be given in high schools and private schools and also to kindergarten trainees and trainee teachers. It is pleasing to record the co-operation of the Kindergarten Union and the Education Department.

Five trips were made on the Trans-Australia railway line with an excellent response from the mothers living in these isolated parts.

The Pre-School Section continues to increase its activities. In the course of the year, 147 kindergartens were visited and 4,088 children examined medically. One thousand eight hundred and thirty conditions were notified to the parents and 751 children were referred for the attention of their family doctors. One hundred and forty-eight home visits were paid by Sisters.

The Refresher Course of one week's duration was held during the year and Dr. Gibson expresses her appreciation of the advice given to the Section by Professor Macdonald, Professor of Child Health at the University of Western Australia, who is also a consultant to this Department.

The usual co-operation and assistance has been received from the Lotteries Commission and Local Authorities, to which acknowledgment should be made.

#### SCHOOL MEDICAL SERVICE

Dr. Davidson has summarised the activities of the School Medical Service—see Appendix XV.

Attention should be drawn to the work which was done on a survey of the heights and weights of school children in this State. In comparison with the year 1940, it is noted that there has been an increase in height of over one inch throughout the school-age range in both boys and girls. It is also interesting to note that the heights and weights of the school children of this State for the years 1940–1958 are almost identical with those of the children in the London County Council schools in the years 1938–1954 respectively.

The work of the service has been facilitated by the appointment of an additional Medical Officer.

#### OPHTHALMIC SECTION

Professor Ida Mann (see Appendix XVI) reports that the change in treatment to the use of a long-acting sulpha preparation (Lederkyn) is effective. This has the advantage that only one dose a day is required.

With the establishment of a virus laboratory in this State, efforts to cultivate the infective agent of trachoma will be made next year.

#### SCHOOL DENTAL SERVICE

The School Dental Service remains seriously handicapped by the shortage of staff of dental officers. (See the report of Mr. McKenna, Senior Dental Officer, Appendix XVII.)

The problem of dental caries in children in this State continues at its former level and is a grave reflection on the public health of our community. In spite of the fact that it has been shown elsewhere that fluoridation of water supplies will reduce this problem substantially, the public has been reluctant to give this proposal political sanction. It is once more urged that this effective public health procedure be implemented.

#### NURSING BRANCH

Miss Lee, Principal Matron, reports that her work has been facilitated by the appointment of Miss Beard as Assistant Matron (see Appendix XIX).

The difficulties experienced in the provision of nursing staffs in hospitals have not been so acute as in the previous year. These difficulties have been at their worst in the smaller hospitals and frequently there has been only one trained nurse on the staff. The community should be grateful for the services of this band of devoted women, given often in conditions of hardship.

#### NURSES REGISTRATION BOARD

See Appendix XX.

#### PHOTOGRAPHIC SECTION

The report of the Senior Medical Photographer, Mr. Plummer, is contained in Appendix XXI.

The work of this Section continues to be of very high standard and services are supplied not only to the Public Health Department but also to the Fremantle Hospital, the Princess Margaret Hospital for Children and the King Edward Memorial Hospital for Women.

Mr. Plummer's services have also been utilised by private practitioners.

Mr. Plummer is to be congratulated that during the year he was elected a Fellow of the Royal Photographic Society of Great Britain (Medical) as a result of his submission of work and a thesis. He is the only one such in this State.

#### HEALTH EDUCATION

Mr. Carr, Executive Officer of the Health Education Council, has submitted a brief report on the activities of the Council, which have continued on the lines of the previous year (see Appendix XXII).

With the passage of the Health Education Act this year, the Health Education Council will be established as an autonomous body next year.

#### CONCLUSION

Acknowledgment is due to the continued loyal co-operation and assistance of the staff of the Department, which has maintained a high standard throughout the year. Without this assistance and the sympathetic encouragement of yourself, the year's work would have proceeded less harmoniously and produced less satisfactory results.

LINLEY HENZELL, M.D. (London), B.Sc., D.P.H.,  
Commissioner of Public Health.

## Appendix I

### VITAL STATISTICS FOR WESTERN AUSTRALIA

		1956	1957	1958
Mean Population—				
Males	....	348,835	355,518	361,951
Females	....	328,482	336,205	343,649
Total	....	677,317	691,723	705,600
Births—				
Males	....	8,870	8,738	8,532
Females	....	8,046	8,186	8,199
Total	....	16,916	16,924	16,731
Birth rate per 1,000 of Mean Population	....	24.98	24.47	23.71
Deaths—				
Males	....	3,265	3,126	3,270
Females	....	2,307	2,171	2,284
Total	....	5,572	5,297	5,554
Death rate—rate per 1,000 of Mean Population	....	8.23	7.66	7.87
Natural increase rate per 1,000 of Mean Population	....	16.75	16.81	15.84
Infant Mortality per 1,000—				
Live Births :				
Metropolitan Area	....	17.87	19.39	19.52
Rest of State	....	27.82	22.83	23.61
Whole State	....	22.70	21.09	21.52
Stillbirths :				
Metropolitan	....	111	117	107
Whole State	....	226	245	225

*Comparison of Infant Mortality and General Death Rate*

Place	Infant Mortality			General Death Rate		
	1956	1957	1958	1956	1957	1958
New Zealand (a)	....	19.39	19.98	19.40	9.00	9.29
Western Australia	....	22.70	21.09	21.52	8.23	7.66
New South Wales	....	23.47	22.70	21.29	9.58	9.20
Victoria	....	19.32	20.16	19.23	9.17	9.03
Queensland	....	22.74	21.62	19.40	8.92	8.39
Tasmania	....	20.98	20.15	19.49	7.80	8.09
South Australia	....	19.88	20.63	22.40	8.95	8.67

(a) Non-Maori.

## Appendix II

### PUBLIC HEALTH LABORATORIES

To the Commissioner of Public Health.

The Public Health Laboratories continued their important function as one weapon in the control of communicable diseases.

Examinations were done for the Government departments, local authorities, and doctors in private practice.

Apart from regular bacteriological control of drinking water, milk and milk products, food (fresh and frozen : especially eggpulp), and conserves, the laboratories have been active in sewage surveys for salmonellae as well as investigating the effect of chlorination on the sewage coliform count. The bacteriological analysis of water at several metropolitan beaches was regularly performed.

An important part of the Public Health Laboratories' work was the investigation into the occurrence of Salmonellae in foodstuffs and other possible vehicles of spread of these bacteria.

Besides S.perth (38:y:e,n,x) found last year in desiccated coconut a further new *Salmonella* serotype : S. fremantle (42:gt:-) was cultured in these laboratories from the faeces of a gastro-enteritis case in the course of the examination of human material which was done parallel to the extensive *Salmonella* survey on other sources. Both of the new serotypes were investigated by Dr. Nancy Atkinson, Head of the *Salmonella* Reference Laboratory in Adelaide, to whom we are most indebted.

Investigation was also made into the occurrence of *Salmonellae* in fertilisers of animal origin (blood and bone, meatmeal, etc.) and a high incidence established of contamination by enteric pathogens.

The Perth Chest Hospital was opened towards the end of August and the Tuberculosis section of the laboratories was transferred to this Hospital. As the vast majority of tuberculous cases in Western Australia are treated in this hospital, the laboratories of this establishment are the convenient place for tuberculosis diagnosis and research work. Besides tuberculosis examinations the Public Health Laboratories have undertaken the pathology service of the hospital including general bacteriology, serology, haematology and biochemistry.

#### Routine Examinations.

Table No. 1 shows a comparison of the bacteriology work carried out in the Public Health Laboratories during the years 1957 and 1958.

During the year the only decrease has been in the general bacteriological examinations made for the Royal Perth Hospital, i.e., 670 (67·9 per cent.) and this has been offset by the increase in work carried out for the Public Health Department and in investigation on *Mycobacterium tuberculosis*. The increases were in general bacteriology for the Public Health Department 208 (1·3 per cent.) and in *Mycobacterium tuberculosis* investigations for the Royal Perth Hospital 168 (7·8 per cent.) and for the Public Health Department 388 (8·2 per cent.).

From August up to the end of the year 2,373 examinations were done for the Perth Chest Hospital.

Thus the work performed during 1958 shows an overall increase of 2,467 (10·86 per cent.) examinations.

It is important to mention that these statistics do not reflect clearly the actual work involved as the big-scale public health examinations performed in 1958 required much more time than the corresponding number of clinical bacteriological examinations.

Table 1  
*Statistics of Bacteriology Laboratories*

	1957			1958			
	Royal Perth Hospital	Public Health Dept.	Total	Royal Perth Hospital	Perth Chest Hospital	Public Health Dept.	Total
Bacteriology tests without <i>M. tuberculosis</i> and <i>M. leprae</i> .... .... .... ....	988	14,851	15,839	318	....	15,059	15,377
<i>M. tuberculosis</i> and other tests .... ....	2,161	4,727	6,888	2,329	2,417	5,071	9,817
Bacteriology—Total .... .... .... ....	3,149	19,578	22,727	2,647	2,417	20,130	25,194

The monthly distribution of work is seen in Table No. 2 and the distribution of specimens is shown in Table No. 3.

**Table 2**  
*Monthly distribution of Examinations*

—	Jan.	Feb.	Mar.	Apl.	May	June	July	Aug.	Sept.	Oct.	Nov.	Dec.	Total, 1958	Total, 1957	Increase or Decrease per cent.
<i>General Bacteriology and M. leprae:</i>															
Royal Perth Hospital ....	65	16	4	....	47	84	88	14	....	....	....	....	318	988	— 670 = — 67·9
Public Health Department ....	1,158	1,137	1,277	1,269	1,123	1,396	1,581	1,199	1,572	1,198	1,047	1,102	15,059	14,851	+ 208 = + 1·3
<i>M. tuberculosis :</i>															
Royal Perth Hospital ....	201	178	223	215	175	185	205	174	251	232	139	151	2,329	2,161	+ 168 = + 7·8
Perth Chest Hospital ....	....	....	....	....	....	....	....	21	570	901	428	453	2,373	....	
Public Health Department ....	422	378	415	378	432	412	427	509	395	488	421	438	5,115	4,727	+ 388 = + 8·2
Number of Examinations : Total	1,846	1,709	1,919	1,862	1,777	2,077	2,301	1,917	2,788	2,819	2,035	2,144	25,194	22,727	+ 2,467 = + 10·86

**Table 3**  
*Distribution of Specimens*

Examinations	Public Health Department	Royal Perth Hospital	Perth Chest Hospital	Total
<i>Bacteriology—</i>				
Animal Inoculations (excluding Tb inoculations) ....	63	....	....	63
Blood Cultures ....	56	....	....	56
Brucella Cultures ....	3	....	....	3
C.S.F.—(a) culture ....	32	....	....	32
(b) micro ....	46	....	....	46
Dark Ground Examination ....	16	....	....	16
Ear and Eye Swabs—culture ....	49	....	....	49
Fluids, serous cavities—(a) culture ....	11	....	....	11
(b) micro ....	11	....	....	11
Faeces—(a) culture ....	618	....	....	618
(b) micro ....	31	....	....	31
Fungi examinations ....	9	....	....	9
Gonococci—(a) smears ....	1,415	....	....	1,415
(b) cultures ....	354	....	....	354
K.L.B. swabs for ....	592	318	....	910
Other throat swabs—not K.L.B.—(a) cultures ....	51	....	....	51
(b) micro ....	18	....	....	18
Nasal swabs ....	15	....	....	15
Pus cultures ....	291	....	....	291
Sensitivity tests ....	1,205	....	....	1,205
Sputa—(a) culture ....	46	....	....	46
(b) micro ....	43	....	....	43
Urine—(a) culture ....	268	....	....	268
(b) micro ....	275	....	....	275
(c) general ....	2	....	....	2
Vaccines ....	99	....	....	99
Vaginal swabs—(a) culture ....	69	....	....	69
(b) micro ....	69	....	....	69
M. tuberculosis (including animal inoculations) ....	5,115	2,388	2,373	9,816
M. leprae ....	40	1	....	41
Milk ....	25	....	....	25
Eggs, Fresh ....	124	....	....	124
Frozen foods—(a) Eggpulp ....	1,022	....	....	1,022
(b) Miscellaneous ....	17	....	....	17
Tinned foods ....	11	....	....	11
Miscellaneous food ....	3	....	....	3
Oysters ....	303	....	....	303
Miscellaneous—(a) Animal fodder ....	6	....	....	6
(b) Fertilisers animal origin ....	80	....	....	80
(c) Mesenteric glands ....	200	....	....	200
Rat Survey ....	26	....	....	26
Cool drinks ....	101	....	....	101
Water—(a) drinking ....	3,282	....	....	3,282
(b) river, ocean ....	2,082	....	....	2,082
(c) sewage ....	844	....	....	844
(d) sterilisation ....	24	....	....	24
Moore Swabs—(a) Reservoir ....	77	....	....	77
(b) River ....	179	....	....	179
(c) Sewage ....	657	....	....	657
Blood films—Malaria ....	1	....	....	1
Faeces—(a) Amoebae ....	38	....	....	38
(b) Worms or ova ....	24	....	....	24
Vaginal smears and swabs for Trichomonas—(a) smears ....	61	....	....	61
(b) swabs ....	39	....	....	39
Miscellaneous ....	36	....	....	36
Total ....	20,174	2,647	2,373	25,194

### Meningitis

Three strains of *H. influenzae*, type B were cultured from cerebrospinal fluid sent to the laboratory.

#### Blood Cultures

The positive blood cultures were distributed between the following species :—

<i>S. typhi</i>	....	....	....	....	14 specimens (10 cases)
streptococcus haemolyticus	....	....	....	....	2 specimens (2 cases)
<i>Staphylococcus haemolyticus</i>	coagulase positive	....	....	....	5 specimens (4 cases)

#### Mycobacteria

Five thousand, seven hundred and twenty-four specimens were examined in the Tuberculosis Laboratory and 304 (5·3 per cent.) were found to be positive. The distribution of the specimens was as follows :—

Sputum	....	....	....	....	4,033
Gastric Contents	....	....	....	....	729
Laryngeal Swabs	....	....	....	....	350
Pleural Fluid	....	....	....	....	49
Cerebrospinal Fluid	....	....	....	....	13
Urine	....	....	....	....	385
Blood	....	....	....	....	14
Miscellaneous	....	....	....	....	151

The 304 positive specimens originated from 123 cases.

Two patients were found infected with *M. tuberculosis* var. *bovis*. In one case the acid-fast bacilli were cultured from the pus from a sinus in the hip. The other case was diagnosed as an urinary tract tuberculosis. In the six specimens examined from these cases the guinea-pig inoculation gave much better results than the culture.

Besides the 123 cases mentioned above, from the sputa of 18 cases anonymous (atypical) mycobacteria were isolated. These were differentiated as under :—

Group II	....	....	....	....	5
Group III	....	....	....	....	11
Group IV	....	....	....	....	2

In Group IV single specimens only were received from the cases.

The most important finding was that in 11·5 per cent. of the bacteriologically-confirmed cases anonymous (atypical) Mycobacteria only were cultured. This 11·5 per cent. does not include the two cases where anonymous (atypical) bacterial Group IV (saprophytes) were found.

The method used in the Laboratories was described in the Yearly Report for 1957. The neutralisation of the centrifuged sediment proved very satisfactory.

From the 304 positive specimens 270 were positive on culture and in some cases in guinea-pig also and 34 in guinea-pig only. The comparative value of the media used : Loewenstein-Jensen, Blood and Kirchner medium and the contamination rate can be seen in Tables Nos. 4 and 5.

The significant conclusion derived from these Tables is that 23 per cent. of the positive specimens would have been missed without the use of fluid medium. This result was achieved in spite of the higher contamination rate of this medium.

Table 4

#### Relative Values of Different Media in the Culture of *Mycobacterium tuberculosis*

3 media used, viz., Loewenstein-Jensen (L.J.), Blood Medium (B.M.) and Kirchner Medium (K.).  
270 strains of Myco. tuberculosis

findings :

(1) All 3 media showed growth with	74 strains	27·4%
(2) Only Kirchner medium showed growth with	62 ,,	23%
(3) Kirchner +ve with (a) L.J. +ve, B.M. —ve with (b) L.J. —ve, B.M. +ve	24 ,, 37 ,,	(8·9%) (13·7%) } 61 (22·6%)
(4) Kirchner —ve with (a) L.J. +ve, B.M. +ve (b) L.J. +ve, B.M. —ve (c) L.J. —ve, B.M. +ve	24 ,, 27 ,, 22 ,,	(8·9%) (10 %) (8·1%) } 73 (27 %)

To summarise :

Kirchner medium alone succeeded with 62 strains (23%) and alone failed with 73 strains (27%).

Loewenstein-Jensen medium alone succeeded with 27 strains (10 %) and alone failed with 121 strains (45%).

Blood medium " " " 22 ,,(8·1%) " " 113 ,,(42%)

i.e.—The time has not yet come when we can afford to dispense with any of the three media now used.

The negative report due to the reduction of the number of tubes or different media used may cost the community in each case several thousand pounds.

Table No. 5

*Statistical Analysis on 17,995 Tubes of Different Media used during the year of 1958*

Media	Total No. of tubes inoculated	Negative		Positive		Atyp. Mycobact.		Contaminated	
		No.	%	No.	%	No.	%	No.	%
Lowenstein-Jensen Medium .... ....	7,324	6,792	92.8	230	3.1	28	0.4	274	3.7
Blood Medium .... .... ....	7,072	6,579	93.0	245	3.5	31	0.5	217	3.0
Kirschner Medium .... .... ....	3,599	3,146	87.4	197	5.5	21	0.6	235	6.5
Total for the Year .... ....	17,995	16,517	91.8	672	3.7	80	0.5	726	4.0

*Diphtheria*

Nine hundred and ten specimens were examined from cases, contacts and carriers and 2,358 examinations were done.

Twenty-seven positive specimens were found on Loeffler slope, Tellurite plate of modified Schroer enrichment medium. From these, 19 parallel specimens were cultured on three media and gave the following results :—

Positive on :

Loeffler	Tellurite Plate	Modified Schroer enrichment medium	No. of Specimens
+	+	+	4
+	+	—	1
+	—	+	1
—	+	+	6
+	—	—	0
—	+	—	2
—	—	+	5

As seven strains were received from outside laboratories 34 virulence tests were performed. Twenty-six of these strains were virulent, their types being distributed as follows :—Eight gravis and 18 mitis strains.

*Shigella Infection*

Seventeen cases of Sh. flexneri and one case of Sh. sonnei were diagnosed.

*Salmonellosis Infection*

"The incidence of food-borne salmonellosis is not accurately known, but it is great, perhaps rivalling the common cold in frequency." (N. B. McCullough.)

An endeavour has been made in these laboratories to investigate the occurrence of Salmonellae in some vehicles which could be agents in the spread of these organisms.

Salmonella infection can be transmitted occasionally to man by direct contact with a person or domestic animal suffering from an infection or by convalescent carriers and symptomless excretors. But the most common source of infection is the faeces of man and domestic animals including poultry and household pets (cats and dogs). Eggs of fowls and ducks play an important part in the transmission.

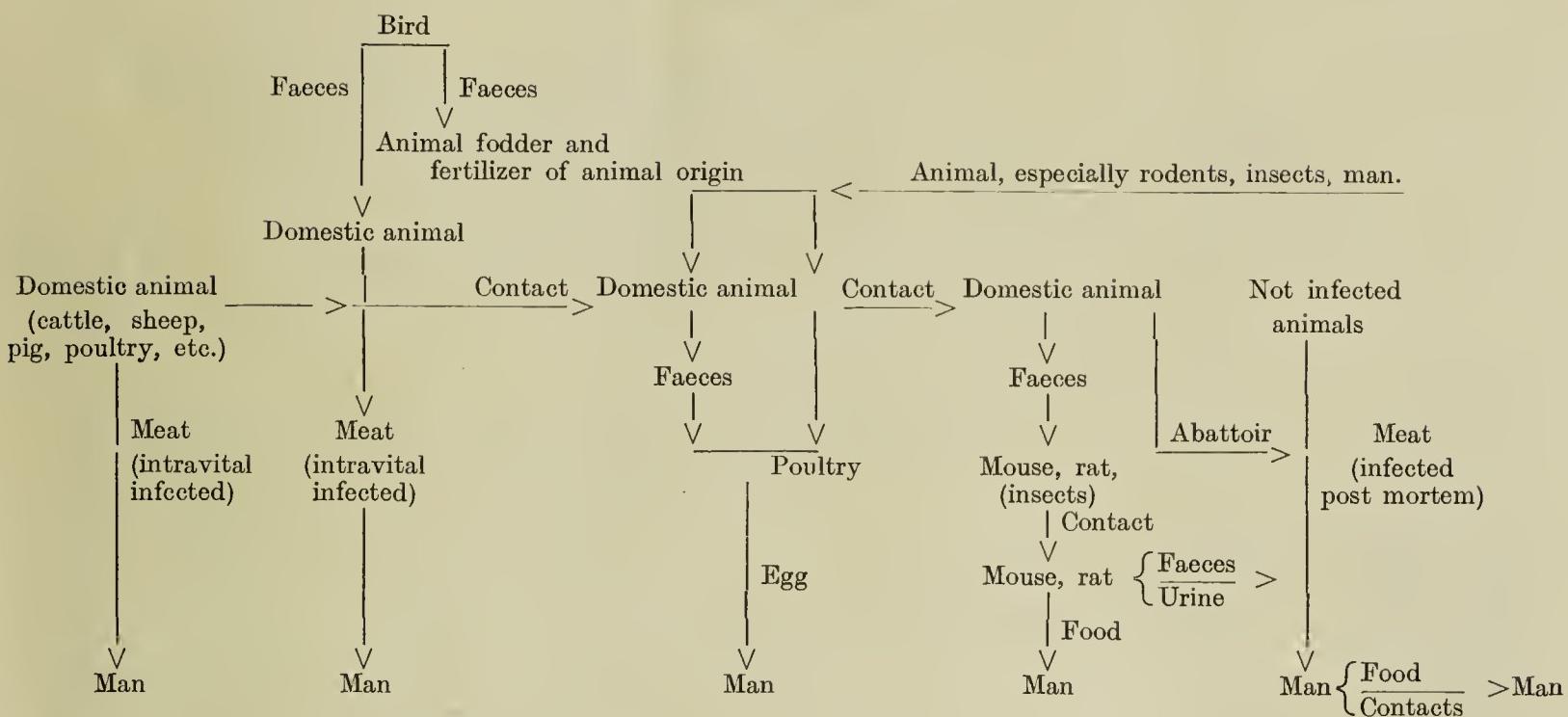
The transmission of Salmonellae to man can further occur directly by ingestion of contaminated food and indirectly by salmonella-contaminated fodder consumed by animals. One of the sources of this spread of salmonellosis is kitchen refuse fed to pigs and to chicken stock. The various fertilisers of animal origin and animal fodder such as meat-meal and blood and bone can also be an important source of salmonellosis, e.g., it was shown in these laboratories that 48.9 per cent. of the specimens of these fertilisers examined contained Salmonellae. The path of infection of Salmonella gastro-enteritis is shown in the accompanying chart (Table No. 6).

One of the most important public measures for the prevention of the spread of salmonellosis is tracing all sources of its dissemination and the reporting of all human cases, including "gastric upsets" or common diarrhoeas. In this task the collaboration of the general practitioner is essential. It is suggested that the Public Health Department approach all practitioners advising them to send specimens of faeces and vomit to the Laboratories. Only such wide-scale investigations of outbreaks will allow us to bring salmonellosis under control.

Table No. 6

*Path of Infection of Salmonella Gastro-Enteritis*

(Modified from Bader in Grumbach-Kikuth : Infectious Diseases)



The compulsory control of food handlers should be introduced. This would include not only persons working in food dispensing establishments but also those in food processing plants.

According to Savage (1956) an outbreak of food poisoning—in this case the most common, salmonella food poisoning—can only be fully explained when the four factors involved are known. These are the determination of the bacterial cause of the symptoms, the vehicle responsible for the transmission of the causal agent to man, the reservoir of the infection, and lastly the path from the reservoir to the infected vehicle.

Table No. 7 shows the distribution and sources of the *Salmonella* species cultured in 1958. Included in this table are four cases of salmonella food poisoning caused respectively by *S. fremantle*, *S. eastbourne*, *S. emmastad* and *S. typhi murium* and nine specimens in which *S. bovis* *morbificans* was cultured were from symptomless carriers.

Every *Salmonella* should be regarded as potentially pathogenic to man.

*Frozen Food*

The amount of frozen food consumed is increasing, therefore a standard for its control is under consideration.

Enterococci, which survive for longer periods of time in fresh frozen food, may be a better index of faecal contamination than the coliform group, which decreases in numbers during processing and storage. For the enterococcus count (MPN) the choice of a proper medium was most important. The presumptive count with dextrose-azide broth and the confirmation test in ethyl violet-azide broth proved a most useful combination. Both tests were read after 48 hours incubation at 37° C.

As a provisional standard for frozen pre-cooked food we are using the recommendations of Abrahamson (Department of Health, New York City, N.Y.) as follows :—

Total plate count not exceeding 100,000 colonies per gram.

Coliforms not exceeding 100 colonies per gram.

*Staphylococcus haemolyticus coagulase positive*—nil colonies per gram.

Enterococcus not exceeding 1,000 colonies per gram.

The provisional method for frozen food examination used in our laboratories is given below :—

Weigh 25 gms. of frozen food in a sterile bottle.

Transfer to a Blender.

Add 125 ml. sterile 1/4 strength Ringers solution to obtain a 1 : 5 suspension. Disintegrate for 2–3 minutes (not longer!).

Pour 80 ml. of this 1 : 5 suspension into a sterile 250 measuring cylinder with sterile stopper.

Make up the volume with 1/4 strength Ringers solution to 160 ml., giving a 1 : 10 suspension.

Mix thoroughly by inverting the cylinder several times.

With the remainder of the 1 : 5 suspension inoculate :—

1. Blood agar plates aerobically.
2. Blood agar plates anaerobically.
3. Phenylethylalcohol plates.
4. MacConkey plates.
5. S.S. plates.

Table 7

Distribution and number of *Salmonella* Types isolated in the Public Health Laboratories, Perth, W.A. in the year 1958

Types	Human Sources				Other Sources										
	Faces		Blood		Egg pulps		Oysters	River	Sewage Swabs	Rats	Mesenteric glands	Fertiliser of animal origin			
	Cases	No. of +ve specimens	Cases	No. of +ve specimens											
S. breneney	...	...	...	...	...	...	...	...	...	...	...	6			
S. derby	...	...	...	...	...	...	...	...	...	...	...	6			
S. kaapstadt	...	...	...	...	...	...	...	...	...	...	...	...			
S. paratyphi B.	...	...	...	...	...	...	...	...	...	...	...	...			
S. saint paul	...	...	...	...	...	...	...	...	...	...	...	...			
S. san diego	...	...	...	...	...	...	...	...	...	...	...	...			
S. typhi murium	...	...	...	...	...	...	...	...	...	...	...	...			
Group B (typing in progress)	...	...	...	...	...	...	...	...	...	...	...	...			
S. Bareilly	...	...	...	...	...	...	...	...	...	...	...	...			
S. birkenhead	...	...	...	...	...	...	...	...	...	...	...	...			
S. Braenderup	...	...	...	...	...	...	...	...	...	...	...	...			
S. cholerae suis	...	...	...	...	...	...	...	...	...	...	...	...			
S. oranienberg	...	...	...	...	...	...	...	...	...	...	...	...			
S. potsdam	...	...	...	...	...	...	...	...	...	...	...	...			
Group C (typing in progress)	...	...	...	...	...	...	...	...	...	...	...	...			
Group C <sub>1</sub> (typing in progress)	...	...	...	...	...	...	...	...	...	...	...	...			
S. bovis morbificans	...	...	...	...	...	...	...	...	...	...	...	...			
S. kentucky	...	...	...	...	...	...	...	...	...	...	...	...			
S. muenchen	...	...	...	...	...	...	...	...	...	...	...	...			
S. newport	...	...	...	...	...	...	...	...	...	...	...	...			
Group C <sub>2</sub> (typing in progress)	...	...	...	...	...	...	...	...	...	...	...	...			
S. eastbourne	...	...	...	...	...	...	...	...	...	...	...	...			
S. pullorum	...	...	...	...	...	...	...	...	...	...	...	...			
S. saarbruecken	...	...	...	...	...	...	...	...	...	...	...	...			
S. typhi	...	...	...	...	...	...	...	...	...	...	...	...			
S. amager	...	...	...	...	...	...	...	...	...	...	...	...			
S. anatum	...	...	...	...	...	...	...	...	...	...	...	...			
S. give	...	...	...	...	...	...	...	...	...	...	...	...			
S. lexington	...	...	...	...	...	...	...	...	...	...	...	...			
S. london	...	...	...	...	...	...	...	...	...	...	...	...			
S. meleagridis	...	...	...	...	...	...	...	...	...	...	...	...			
S. nyborg	...	...	...	...	...	...	...	...	...	...	...	...			
S. orion	...	...	...	...	...	...	...	...	...	...	...	...			
S. vejle	...	...	...	...	...	...	...	...	...	...	...	...			
Group E (typing in progress)	...	...	...	...	...	...	...	...	...	...	...	...			
Group E <sub>1</sub> (typing in progress)	...	...	...	...	...	...	...	...	...	...	...	...			
S. cambridge	...	...	...	...	...	...	...	...	...	...	...	...			
S. new brunswick	...	...	...	...	...	...	...	...	...	...	...	...			
S. newington	...	...	...	...	...	...	...	...	...	...	...	...			
S. selandia	...	...	...	...	...	...	...	...	...	...	...	...			
S. senftenberg	...	...	...	...	...	...	...	...	...	...	...	...			
S. taksony	...	...	...	...	...	...	...	...	...	...	...	...			
Group E <sub>4</sub> (typing in progress)	...	...	...	...	...	...	...	...	...	...	...	...			
S. cubana	...	...	...	...	...	...	...	...	...	...	...	21			
S. worthington	...	...	...	...	...	...	...	...	...	...	...	23			
S. adelaide	...	...	...	...	...	...	...	...	...	...	...	1			
S. emmasted	...	...	...	...	...	...	...	...	...	...	...	6			
S. fremantle	...	...	...	...	...	...	...	...	...	...	...	...			
Total	...	...	...	...	24	67	10	14	408	1	5	60	1	104	147

For the serological differentiation of the *Salmonella* strains we are indebted to Dr. Joan Taylor, *Salmonella Reference Laboratories*, Colindale, London, to Dr. Nancy Atkinson, *Salmonella Reference Laboratory*, Adelaide, to Dr. R. Roschka, *Salmonella Reference Laboratory*, Vienna, and to Dr. G. N. Cooper, *Public Health Laboratory*, Melbourne.

6. Wilson and Blair plates.

7. Boiled liver broth, which should be heated after inoculation for five minutes at 80° C. subculture after 24 hours' incubation to blood plates aerobically and anaerobically.

8. Add 10 ml. of the 1 : 5 suspension to 100 ml. 10 per cent. NaCl liver broth.

9 and 10. Distribute the remaining 1 : 5 suspension in :

100 ml. single strength selenite broth, subculture after 24 and 48 hours' incubation to S.S. and W.B. plates, and 100 ml. Tetrathionate broth, subculture after 24 and 48 hours' incubation to S.S. and W.B. plates.

Make serial dilutions with 1/4 Ringers solution, of 1/100, 1/1,000, 1/10,000, 1/100,000 from the 1 : 10 suspension.

From each dilution including 1 : 10 pour

- (a) 1 ml. into each of four plates : two Meat Infusion Agar and two MacConkey. The Meat Infusion Agar and MacConkey plates should be read after 48 hours' incubation at 37° C.
- (b) 1 ml. into 10 per cent. NaCl liver broth and inoculate the blood agar plates after 24 hours' incubation.

#### M.P.N. Counts

Coliform count (MacConkey broth).

Enterococci (Dextrose-sod. azide broth : DA broth) :

- 5 x 10 ml. in double strength medium by using 10 ml. from the 1 : 10 dilution.
  - 5 x 1 ml. in single strength medium by using 1 ml. from the 1 : 10 dilution.
  - 5 x 0.1 ml. in single strength medium by using 1 ml. from the 1 : 100 dilution.
  - 5 x 0.01 ml. in single strength medium by using 1 ml. from the 1 : 1,000 dilution.
- Incubate tubes for 48 hours at 37° C. and confirm Enterococci by subculturing one spiral loopful of Ethylviolet-sod. azide tubes incubating for 48 hours at 37° C.

#### Eggpulp

The laboratories investigated 1,022 samples of frozen eggpulp. The method used for these examinations was reported in the yearly report of the laboratories for 1957.

The results of these examinations are given below :

Total number of eggpulp specimens examined	....	....	....	....	....	1,022
Salmonella positive specimens	....	....	....	....	....	378 (37%)
Specimens containing S. pullorum only	....	....	....	....	....	224 (21.9%)
Specimens containing Salmonella including 20 which also had S. pullorum	....	....	....	....	....	154 (15.1%)
Single contamination : Number of specimens	....	....	....	....	....	350
Double contamination : Number of specimens	....	....	....	....	....	27
Quadruple contamination : Number of specimens	....	....	....	....	....	1

From 378 specimens 408 *Salmonella strains* were isolated.

From 27 doubly contaminated specimens, 19 contained S. pullorum and one other *Salmonella* serotype.  
Double contamination :

S. pullorum and S. typhi murium	....	....	....	....	....	....	12
S. pullorum and S. oranienberg	....	....	....	....	....	....	2
S. pullorum and S. senftenberg	....	....	....	....	....	....	1
S. pullorum and S. adelaide	....	....	....	....	....	....	3
S. pullorum and S. worthington	....	....	....	....	....	....	1
S. typhi murium and S. derby	....	....	....	....	....	....	3
S. typhi murium and <i>Salmonella</i> Group C	....	....	....	....	....	....	1
S. typhi murium and S. oranienberg	....	....	....	....	....	....	1
S. typhi murium and S. senftenberg	....	....	....	....	....	....	1
S. typhi murium and S. give	....	....	....	....	....	....	1
S. oranienberg and S. give	....	....	....	....	....	....	1
Total specimens	....	....	....	....	....	....	27

#### Quadruple contamination :

From one specimen *Salmonella* Group C1, Group E, S. adelaide and S. pullorum were isolated.

The analysis of these examinations demonstrate that 37 per cent. of frozen eggpulp examined contained *Salmonellae*, although in 21.9 per cent. of the specimens only S. pullorum was recovered. S. pullorum is generally considered as nonpathogenic for man although there have been few outbreaks of food poisoning connected with it.

It is essential that legislation be brought in to ensure that eggpulp can only be sold when no *Salmonellae* are detected in this product. A pasteurization plant similar to that used in the milk industry will kill almost 100 per cent. of the *Salmonellae* in the eggpulp and therefore is considered highly satisfactory.

The small difference between the temperature which ensures the death of the *Salmonellae* and that which results in the coagulation of raw egg products presents certain technical difficulties when the heat treatment is to be undertaken commercially. However, carefully controlled experiments carried out in Denmark (W.H.O. Technical Report Series No. 169-1959) have shown that it is possible to pasteurize raw egg products with a reasonable degree of safety. This can be done when the construction of the milk pasteurizer is modified so as to ensure an adequate flow through the apparatus of the circulating water at a temperature that is only 0.5° C. (0.9° F.) higher than the temperature at which the products are being pasteurized. The cooling section of the pasteurizer must also be especially adapted.

The following recommendations are given :—

*Whole egg* : should be pasteurized at 65°-69° C. (149°-156.2° F.) for 90-180 seconds.

*Egg Yolk* : should be pasteurized at 64°-66° C. (147.2°-150.8° F.) for 180 seconds.

*Fermented Egg White* : ammonia is added to reach a pH of 10.3, after which the material is held for 20 hours at 15° C. (59° F.) ; pasteurization is then carried out at 51°-52° C. (123.8°-125° F.) for 90-180 seconds.

*Fresh Egg White* : can be pasteurized at 55°-56° C. (131°-132.8° F.) for 30 minutes, after the addition of 0.5 per cent. to 1.0 per cent. sodium citrate or 10 per cent. to 20 per cent. sucrose, if the whipping ability of the final product is of minor importance.

Besides pasteurization intensive investigation is in progress abroad on sterilisation of foodstuff, especially eggpulp, by gamma rays. The advantage of this method is that it can be applied to the deep frozen product filled into tins.

#### *Fertilizers of Animal Origin*

An important observation was the proof that a high percentage of fertilizers of animal origin and animal fodder such as meat-, fish- and bone-meal, etc., contain *Salmonellae*. Eighty-six specimens were examined in 1958 of which 49 per cent. were positive. From the samples 147 strains and 27 serotypes were isolated, and from one single specimen 13 *Salmonellae* serotypes were cultured. These results drew attention to the high risk of spreading *Salmonellae* through fodder to domestic animals such as poultry, pigs, cattle, etc. The use of *Salmonella* infected organic fertilizers is just as great a potential risk as the foodstuff itself and infected animals and even vegetables may indirectly infect man.

#### *Mesenteric Glands*

Two hundred mesenteric glands of pigs and cattle from a slaughter-house were examined. 30·5 per cent. of the glands contained *Salmonellae* and some of them contained as many as five serotypes.

From a technical aspect this wide-scale examination for *Salmonellae* was only made possible by the introduction of a simple medium for the differentiation of Enterobacteriaceae and a simple method for the testing of lysis decarboxylase was also inaugurated in the laboratories. A micro method for the detection of indole was developed and an article on this subject will be published in the Journal of Clinical Pathology.

The method used for *Salmonella* diagnosis was published in the yearly report for 1957.

#### *Typhoid Fever cases connected with bathing at City Beach, Perth, W.A.*

The aetiological agent of typhoid fever is *S. typhi* which is derived from the bodies of infected persons and probably sea birds (see under "Pollution of Sea-waters", Steininger). The main source of infection is the human intestinal and urinary tracts. Transmission of the infection is direct from man to man through (patients with frank disease) cases, symptomless excretors, and chronic carriers of the disease; or it is indirectly spread through water, milk and milk products, especially ice cream and other food such as raw fruit, vegetables, shell-fish, etc. Besides its dissemination by human hands its transmission by flies should also be mentioned. ("Fingers Food Faeces Filth Flies".)

Enteric fever results from ingestion of the bacteria. *S. typhi* is highly infectious for man although by ingestion generally only one-third of the exposed persons will contract the disease, one-third will not show symptoms but will react by the production of antibodies and the remaining one-third will show no reaction at all.

During the summer of 1958 an increase in typhoid fever incidence occurred in Western Australia. A number of these typhoid cases were found by Dr. Snow, Director of Epidemiology, to be connected with bathing at City Beach on the Indian Ocean, one of the popular beaches near Perth. *S. typhi* (of four separate phage types) was cultured from these cases, either from their blood or faeces. The blood clot from the specimen sent for the Widal reaction was also used with good results for the recovery of *S. typhi*.

Four separate phage types—A, C<sub>1</sub>, D<sub>1</sub>, and E<sub>1</sub> were cultured from these cases, while another strain was "untypable".

The phage types found during these outbreaks and the phage types found in the previous years are demonstrated in Table No. 8.

Table No. 8  
*Salmonella typhi Phage Types*

Phage Type	1954-1957			1958			Other Sources Sewerage
	Human Sources			Human Sources			
	No. of Cases	Blood	Faeces	No. of Cases	Blood	Faeces	
A ....	1	....	1	3	2	1	...
C ....	2	1	1	....	....	....	...
C <sub>1</sub> ....	1	1	....	2	2	....	...
D <sub>1</sub> ....	1	....	1	5	3	2	...
D <sub>6</sub> ....	1	1	....	....	....	....	...
E <sub>1</sub> ....	6	1	5	3	....	3	...
F <sub>1</sub> ....	1	1	....	....	....	....	...
T <sub>1</sub> ....	2	....	2	....	....	....	...
Degraded ....	3	....	3	6	3	3	9
Total ....	18	5	13	19	10	9	9

For the phage typing of the typhi strains we are indebted to Dr. G. N. Cooper, Bacteriologist, Public Health Laboratories, Melbourne, Victoria.

During this epidemic there was an unexpected observation when a boy, whose mother contracted typhoid from her mother-in-law who had had typhoid several years ago, became a carrier with an *S. typhi* strain phage type D<sub>1</sub> after bathing at City Beach. It was interesting to note that the boy escaped infection

at home in spite of the fact that both his mother and grandmother excreted *S. typhi* E<sub>1</sub>. In the resultant survey for possible carriers in this family, *S. bovis* *morbificans* was found in three specimens of faeces, each from the father and two sisters. This last observation drew attention to the fact that sub-clinical infections with *Salmonellae* occur more often than we envisage and the epidemiology of *Salmonellae* can only be followed by a large scale laboratory control.

During the typhoid epidemic a systematic examination of the sewage for *Salmonellae* was introduced mainly by the use of Moore swabs. Six hundred and fifty-seven swabs were examined from these sources and 60 *Salmonella* strains were isolated. In the effluent from the Claremont Mental Hospital an *S. typhi* and other *Salmonellae*, especially *S. paratyphi* B, were repeatedly found.

No *Salmonella typhi* phage types A, C<sub>1</sub>, D<sub>1</sub>, or E<sub>1</sub> were recovered from the sewage. Further, neither the direct vehicle responsible for the transmission of the causal agent to man nor the reservoir of infection could be traced in the outbreak connected with bathing at City Beach.

#### *Enteric Fever in connection with pollution of sea water*

Contamination of sea bathing areas—as well as all outdoor bathing places—may be caused by the bathers themselves, by animals, by human excreta discharged from boats, sewage from dwellings, factories, and most of all by public sewerage systems. The hazard from a relatively small amount of sewage pollution in close proximity to a bathing area is much greater than a large amount at a considerable distance.

Swimming in polluted sea water has been implicated in the transmission of different diseases, e.g. conjunctivitis, otitis, sinusitis, rhinitis, tonsillitis, sore throat, furunculosis, fungus and virus infections, and enteric infections ; e.g., cholera and salmonella infections such as typhoid and paratyphoid fevers.

Paratyphi B infections are known to result from bathing in salt water in harbours and beaches. *S. paratyphi* B may survive in sea water for a considerable time and in related laboratory experiments this organism was recovered up to two months (Moore). Also some harbours and estuaries in Germany harbour a considerable number of *S. schottmuelleri* (Steininger). In spite of this the number of cases of enteric disease contracted from bathing is not alarming. The real danger lies probably more in the consumption of fish which is landed and cleaned on the shore and especially the eating of shellfish : oysters and clams. One possible explanation is that the infective dose of *S. paratyphi* B for man is relatively high and the number of bacteria ingested by swallowing during bathing is normally insufficient to cause paratyphoid B infection. By eating raw shellfish, however, a considerable risk of contracting enteric infection, including dysentery, exists. Shellfish feed on microscopic life in sea water and concentrate bacteria in their digestive tract.

The conditions governing the contracting of typhoid fever are different from those governing paratyphoid infection. According to Kehr and Butterfield (Public Health Reports, Washington, 1943, 58 589) one single bacterium may be sufficient to cause an infection in man. In this respect this species behaves differently from the other *salmonellae*, the infective dose of which is by ingestion of hundreds of thousands to several million bacteria. As a good swimmer regularly draws water into his mouth and blows it out again, he may swallow—as experience has shown—about 50 ml. of water during swimming. While surfing, however, twice as much water may be swallowed. Although the mortality of *S. typhi* is very high during the first few hours or days of exposure to sea water, many of the bacteria will survive for several days and probably weeks. Therefore if sewage effluent carries excreta from typhoid cases or carriers to the ocean the necessary oral infective dose of *S. typhi* can be ingested despite dilution by the water. In spite of the above only a few outbreaks of typhoid fever have been connected with bathing in *S. typhi*-infected sea water. One of the classical outbreaks is known to have been due to bathing in the polluted harbour of New Haven, Connecticut (Winslow and Moxon, 1928).

Individuals suffering from *Salmonella* infection and symptomless excretors and chronic carriers may pass many millions of pathogens in their excreta. The average daily weight of faeces excreted by an adult is about 100 grammes and many millions of *Salmonella* may be present per gram in the stools of an infected person. Sometimes the pathogens are not even greatly outnumbered by *B. coli*. It was observed (Thomson, 1954) that frequently more *S. typhi* or *S. paratyphi* B were found in the faeces of chronic carriers—the presence of whom can be expected in most large cities—than in the stools of patients suffering from enteric infection. Similarly animal excreta may harbour *Salmonellae* and constitute a further source of infection. Taking this into account it is obvious that in the sewage of all big communities *Salmonellae* are constantly present. In the London Metropolitan Water Board river intakes the ratio of *Salmonella* to *E. coli* varied from 1 : 3,800 to 1 : 180,000.

A few references concerning the viability of *S. typhi* in sea water will demonstrate our present knowledge on this subject :

de Gaxa found a survival time of 9 days.

Soper found a survival time of 2–3 weeks.

Trawinski found a survival time of 12–16 hours.

Beard and Meadowcroft recorded in sea water a survival time of 12–32 days.

Buttiaux and Leurs observed in water a mortality of 38 per cent. in 44 hours.

During exposure to sea water the percentage of bacteria which die may fall from the first day onwards. It is tempting to postulate a “survival of the fittest.” There is not much known about the virulence of these pathogens in sea water and there is a possibility that in a poor medium like salt water their infectivity is low. A weakened virulence could be one further possible explanation for the rarity of outbreaks of enteric fever connected with bathing.

There are many reasons why sewage bacteria and enteric pathogens die in the sea water. The most significant agent is most probably a biological one which has been shown to be heat labile, removed by

filtration and related to the normal marine organisms. Waksman et al. summarise the factors adversely affecting the bacterial survival as follows :—

Presence of toxic substances.

Bacteriophage.

Adsorption of bacteria by sea bottom and sedimentation.

Effect of sunlight.

Consumption of bacteria by protozoa and other lower animals.

Bacterial antagonisms.

Lack of nutrient in the sea water.

Steininger found that *S. paratyphi B* may multiply in the standing water of tidal pools when the concentration of proteins was sufficient. That the presence of organic nutrient and industrial organic waste may tend to offset bacterial die-away was further observed by Buttiaux and Leurs, and by Orlob. Steininger has also shown that *S. typhi* may multiply in the protein particles in the sea water and that several species of sea birds have been infected. (Deutsch. Med. Woch. 1954, 79 : 1118). This author further pointed out that in tidal waters the biological self-purification of the sea is inhibited but by closing harbours or estuaries and eliminating the rise and fall of the tides, the faecal pathogen will soon disappear.

#### *Criteria for recreational uses of marine water*

It is obvious that the bathing areas should be free from visible forms of floating solids and debris of sewage origin that may contain pathogenic organisms. The elimination of these materials is not only a sanitary necessity but also an aesthetic requirement, although the removal of visible forms of sewage matter itself does not necessarily exclude a serious pollution. Further the receiving water should be kept free from offensive smell, disturbing discoloration and grease and oil slicks.

From the public health point of view submarine outfall installations for the disposal of sewage should be designed to operate under such conditions that the quality of the receiving water is not impaired in its beneficial use for bathing, boating, fishing, working environment and shellfish culture.

For the control of outdoor bathing places the following surveys should be observed :—

- (a) The chemical analysis of water : (normally not a sufficiently sensitive test) ;
- (b) the sanitary survey to detect the presence or the possibility of the presence of sewage in the receiving water. This survey will include investigation of such sources of pollution as sewer outlets, float studies, taking into consideration currents, tidal waves, the effect of winds, etc. ;
- (c) the bacteriological analysis of the water ;
- (d) the epidemiological experience.

The most important of these surveys is the bacteriological analysis of the water.

Although newer bacteriological methods are effective in the detection of pathogens in sewage and sewage effluents, it is not yet practicable to use the isolation of pathogenic bacteria as a routine bacteriological method in surveys of rivers and salt waters. As indicators of pollution the coliform group of bacteria are most commonly employed. These include *E. coli* and the coliform group as a whole.

"*E. coli* is of undoubted faecal origin, but the precise significance of the presence in water of other members of the coliform group has been much debated. All the members of the coliform group may be of faecal origin."

(Internat. Standards for Drinking Water, W.H.O., Geneva, 1958.)

It should be further added : "although *E. coli* will nearly always be found in fresh pollution derived from several sources, some other type or types of coliform organisms, not accompanied by *E. coli*, may occasionally be found in fresh pollution from a single source ; furthermore, the presence of *E. coli* may not be indicative of fresh pollution, particularly if the pollution is from a single source, such as a person harbouring in his faeces *E. coli* alone."

"On the other hand, there is little or no evidence that coliform bacteria multiply on fresh grasses or grains ; nor is there evidence that they multiply in soil. Consequently, it is at least debatable whether grasses, grains and soil can be considered normal habitats of any of the coliform organisms."

(Standard Methods for the Examination of Water, Sewage, etc., A.P.H. Assoc., 1955.)

The coliform concentration is expressed by the M.P.N. in 100 mls. of water (off-shore or on-shore) and Prescott, Winslow and McGrady (1946) state : "A single most probable number (M.P.N.) per 100 mls. of sample is the density of organisms most likely responsible for that combination of results. This density may not correspond to the density actually present in a given sample, but in the long run the most probable numbers will represent more closely than will any other series of numbers, the densities of gas-producing organisms in the sample examined." Therefore, it is impracticable, as frequently happens, to think of the M.P.N. numbers as real numbers, representing the true density of the organisms present. To judge in a proper light the empirical nature of the M.P.N. the "confidence limits" of this index according to Swaaroop (Indian J. Med. Res., 1951, V. 19, p. 107) will give a realistic picture. To demonstrate the meaning of these limits one example may be mentioned. In an M.P.N. index of 25, the "confidence limits" lie between 8 (lower limit) and 75 (upper limit).

The coliform concentrations of the beaches are liable to very wide fluctuation, depending among other conditions on the flow of the sewage effluent, especially the tendency for the effluent to spread in a layer on the top of the heavier salt-water and possibly to drift considerable distances without much dilution, the bacterial content of the sewage, currents, tidal movement, wind, rain, climatic conditions, etc. They are expressed in arithmetical means of the M.P.N. or, as this can be distorted by one or two extremely high values over a period, preferably in geometric means as a more precise measure of central tendency. For statistical purposes the monthly averages are usually recorded.

In accordance with current experience the following standards are advised for the bacteriological classification of surface waters used for bathing :—

Water samples collected off shore (in from two to six feet of water) should be grouped into four classes—

Class A : The average coliform index shows a range of 0–50 per 100 mls.

Class B : The average coliform index shows a range of 51–500 per 100 mls.

Class C : The average coliform index shows a range of 501–1000 per 100 mls.

Class D : The average coliform index shows a range of over 1000 per 100 mls.

Class D water needs constant observation.

If the sanitary survey and the epidemiological experience are satisfactory, a beach is generally approved for bathing and recreational purposes when the average coliform index of the monthly samples does not exceed 1,000 coliform bacteria per 100 mls. This standard must nevertheless be co-ordinated with the results of the sanitary survey mentioned above. Although the above figures represent a standard accepted by many health authorities it should be mentioned that others approve beach waters for bathing purposes when the coliform average is above 1,000 but not in excess of 2,400, if the epidemiological experience and sanitary survey are satisfactory. Such water, however, is kept under constant bacteriological observation. Some bathing places in the Swan River would come under these criteria, as the epidemiological experience has shown that no enteric fever outbreaks could be connected with the recreational use of these bathing places.

Prior to 1958 the sewage effluent near the City Beach was discharged into the ocean after plain sedimentation. The flow was about 7,000,000 gallons per day. The effluent discharges about 400 feet into the ocean, in 10 or 12 feet of water. Because of the proximity to the sewage outfall and especially on account of a break in the submarine outfall pipe, the sedimentation method produced heavy contamination of City Beach. Therefore steps were taken to diminish the bacterial counts by treating the sewage ; this chlorination of the sewage effluent has reduced the coliform count significantly.

Until the new pipeline is installed and the new sewage treatment plant is functioning, it is suggested that, for the survey of the City Beach, the monthly averages of the coliform indices should be recorded and, in addition, the percentage of samples at each collecting point showing a M.P.N. of coliform organisms in excess of 50 should be noted.

Although the chlorination of the sewage effluent is the most effective method for the lowering of the coliform index, it has to be mentioned that in California a pre-dilution by pumping sea water into outfall was used. The sea water used ranged from one-half to an equal volume of the effluent itself. This method should help the rapid dispersion of the effluent in the ocean by increasing the salinity and lowering the temperature of the effluent. The economic advantage of this method should be pointed out. The length of the outfall pipe line is a further factor for the proper dispersion of the effluent. American statistics quote outfall pipe lengths from the shore structure seaward as a few hundred feet to over 25,000 feet, depending upon the local conditions.

In 1958 the Public Health Laboratories examined 1,799 water specimens from the beaches to determine the coliform bacterial indices. These 1,799 specimens were collected as under :—

From the City Beach the following samples were collected :—

					Samples
5,000 ft. North of Outfall	....	....	....	....	408
6,000 ft. North of Outfall	....	....	....	....	408
9,000 ft. North of Outfall	....	....	....	....	408
From Swanbourne Beach	....	....	....	....	273
From Warton Street, Cottesloe	....	....	....	....	302

During 151 days morning and afternoon specimens were collected, otherwise only a single specimen was collected daily from the sampling points. The M.P.N. of the samples varied from 0 to 1100+. With the introduction of the chlorination of the sewage effluent discharging near City Beach, the coliform indices of the beaches were—with an occasional exception—far below 50 per 100 ml. of water and often no coliform could be detected in above volumes.

During the typhoid epidemic several attempts were made to isolate *S. typhi* from the surf water and from Moore swabs which were placed near the shore of City Beach. All these examinations gave negative results.

The discharge of unchlorinated final effluent containing pathogens to rivers flowing through towns or to beaches and harbours used for recreational purposes is a public health hazard and proper chlorination will eliminate this danger. One wonders whether it is not correct to say with an editorial of the *Lancet* : “Indeed it is high time that every one (including some of our largest municipal corporations) realised that to pour untreated sewage into the sea is as out of date as the traditional Edinburgh custom of emptying the chamber pot out of the window—and far more dangerous.”

#### *Treponema pallidum Immobilisation Test*

Towards the end of 1957 arrangements were made with Dr. Ad Harris, Director, Venereal Disease Research Laboratory, Department of Health, Education and Welfare, Public Health Service, Chamblee, Georgia, U.S.A., to perform the *Treponema pallidum* Immobilisation Test in selected cases to differentiate between patients with treponemal infection and persons with non-specific reactive sera. The test proved in several instances of great advantage and was of special value to the clinician. For the results of these tests see Mr. A. F. Drummond's report on serology.

## SEROLOGICAL SECTION

Mr. A. F. Drummond, Technical Officer, reports: The following work was carried out during 1958:—

Table No. 9

			Royal Perth Hospital	Public Health Department	Total
Wassermann Reactions	....	....	1,065	4,778	5,843
Kahn Tests	....	....	913	4,337	5,250
Cardiolipin Tests	....	....	1,012	4,357	5,369
Meinicke Clearing Reaction	....	....	193	717	910
Gonococcal Complement Fixation Test	....	....	272	1,343	1,615
Hydatid Complement Fixation Tests	....	....	13	19	32
Widal Reactions	....	....	967	873	1,840
Weil-Felix Reactions	....	....	326	293	619
Abortus Agglutinations	....	....	328	910	1,238
Antiglobulin Test for Brucellosis	....	....	5	13	18
Rickettsial Agglutination and C.F.T.	....	....	....	2	2
Anti Streptolysin O Titre Estimation	....	....	132	115	247
Cold Agglutinations	....	....	7	....	7
Paul Bunnell Tests	....	....	155	110	265
C. Reactive Protein	....	....	168	118	286
Rose and Ball Tests	....	....	206	320	526
S. typhi Vi	....	....	12	54	66
Miscellaneous—					
Agglutination for Viral Hepatitis	....	....	20	36	56
Leptospire Agglutinations	....	....	2	619	621
Medical Legal Examinations—					
Chemical Tests for Blood	....	....	....	69	69
Serological Tests for Blood	....	....	....	90	90
Hair	....	....	....	54	54
Semen examination :					
(a) chemical	....	....	....	80	80
(b) micro	....	....	....	82	82
Miscellaneous—Pathology	....	....	....	1	1
Hormone Tests—					
Toad Tests :					
Qualitative	....	....	668	1,235	1,903
Quantitative	....	....	23	42	65
Friedman Tests	....	....	1	6	7
Ascheim-Zondek Test :					
Qualitative	....	....	....	1	1
Quantitative	....	....	....	....	....
Total	....	....	6,488	20,674	27,162

### TREPONEMAL DISEASES

#### *Meinicke Clearing Reaction*

This test was applied to 910 specimens of blood : a comparison of 877 of these with other tests is shown below. In our laboratory also, this proved to be a most useful and practical test ; the only difficulty noted was in reading some *weak positive* ( $\pm$ ) reactions. Because it requires a minimum of apparatus, this test appears especially suitable for field work.

Comparative results with VDRL Flocculation Test are shown below :—

*Total number of Sera Compared : 877*

Positive VDRL and Positive MKR II	....	=	238	} = 94% agreement
Negative VDRL and Negative MKR II	....	=	591	
Positive VDRL and Negative MKR II	....	=	12	} = 6% disagreement
Negative VDRL and Positive MKR II	....	=	36	
877				

#### *Treponema Pallidum Immobilisation Test*

Seven sera were sent to the Venereal Disease Research Laboratory, Georgia, U.S.A., for this test, from cases whose serological and clinical findings were at variance. The results were shown herewith :—

Patient	Suggestive History	Results				
		WR.	Kahn	VDRL.	MKR.	T.P.I.
A	yes	$\pm$	$\pm$	+	+++	reactive
B	yes	+	++	+	+++	non-reactive
C	yes	$\pm$	$\pm$	+	+++	reactive
D	yes	+	$\pm$	+	++	non-reactive
E	no	$\pm$	$\pm$	—	$\pm$	non-reactive
do.	....	$\pm$	$\pm$	—	—	....
F	no	+	++	+	+++	reactive
G	no	—	$\pm$	+	++	reactive

## LEPTOSPIROSIS IN THE SOUTH-WEST OF WESTERN AUSTRALIA

Blood specimens from 211 dairy farmers (and their families), 367 dairy cattle and 31 pigs were examined in a special survey for serological evidence of leptospirosis and brucellosis.

This work was undertaken for the Director of Epidemiology, to whom all results were furnished. A chart of these results is appended.

The two strains of *L. pomona* used for the agglutination-lysis tests were kindly supplied by Dr. J. Tonge of Brisbane. They were employed in live suspension in Schuffner medium and this medium also served as a diluent for the sera. The range of dilutions was 1 in 20 to 1 in 1,000 (final).

Plastic haemagglutination plates used for incubation were economical of space and time, and entirely satisfactory.

Microscopy was substantially the method of Davidson and Rae—a dry dark-ground condenser, 0·80 NA, and a low power (X10) objective lens. Wide angle oculars (GF x 20) proved most useful in this system.

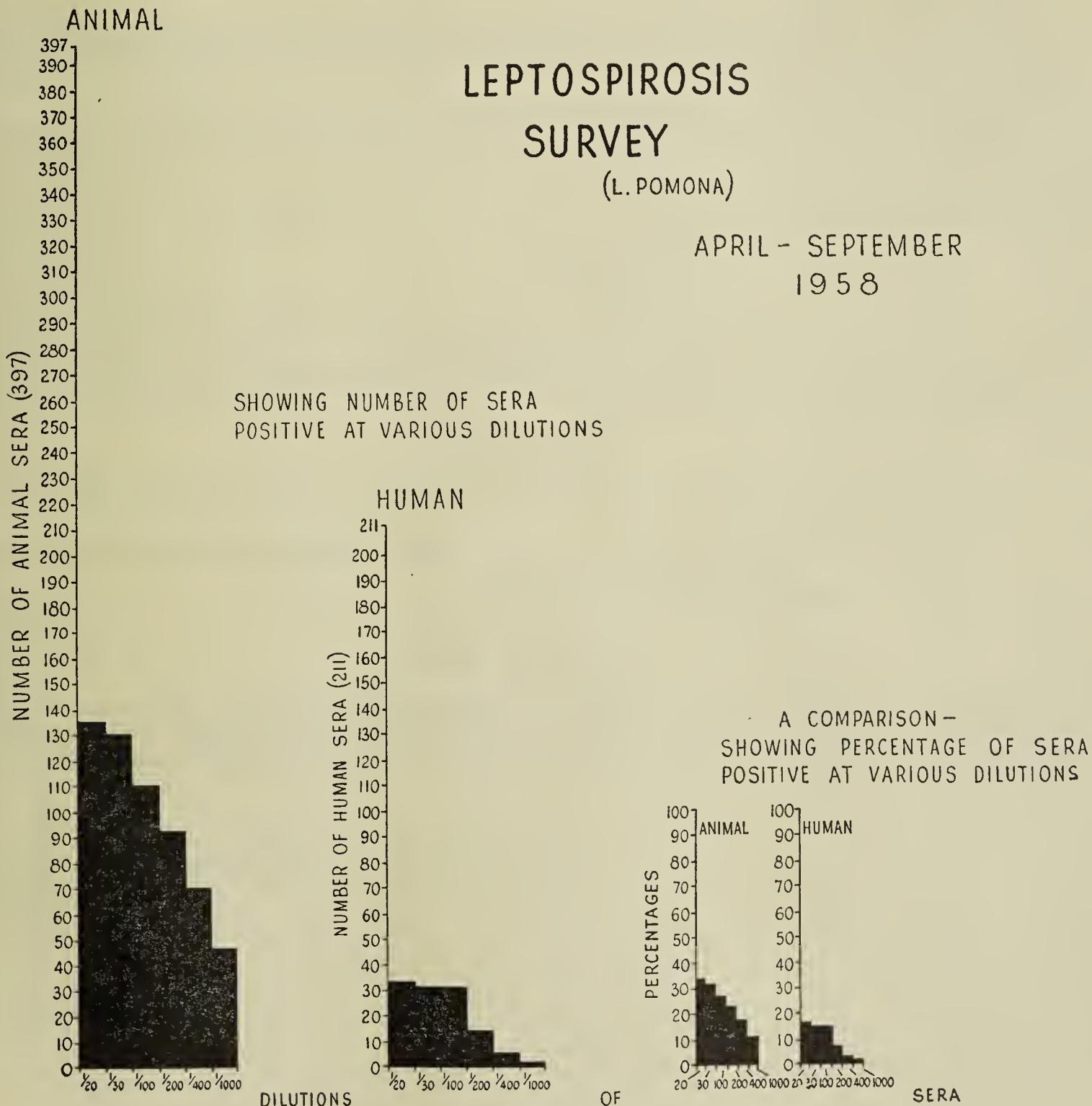
### BRUCELLOSIS

Sera submitted for Leptospiral agglutinins and lysins were also tested for Brucella agglutinins in dilutions of 1 in 20 to 1 in 200. These were sought by direct agglutination tests only, using standard suspension obtained from C.S.L., Melbourne. Results were read after 24 and 48 hours incubation and reported to the Director of Epidemiology. Many of the cattle were stated to have had "Strain 19" vaccine; this was borne out by the presence of agglutinins in the sera of most of these animals.

### MONKEY ERYTHROCYTE TEST IN VIRAL HEPATITIS

In a small series of agglutination tests using Rhesus erythrocytes, we followed the method of Morrison and Hoyt (J. Lab. Clin. Med. May 1957, 49, 5, p.774).

Monkey blood was collected into ACD solution, and deep-frozen in glycerol-citrate solution (Dunsford and Bowley "Technique in Blood Grouping").



The need for a proper assessment of the value of the test in collaboration with clinical findings was felt, but could not be undertaken at the time.

The desirability of the routine use of the test in blood donors might be considered.

Results obtained, and clinical data (when given) are as follows :—

M.E.T.	Positive (titre 1·8 or higher) in cases of (clinical) Viral Hepatitis....	7
M.E.T.	Positive (titre 1·8 or higher) in cases without clinical notes ....	8
M.E.T.	Negative (titre below 1·8); histories not suggestive of Viral Hepatitis .... .... .... .... .... .... .... .... ....	19
M.E.T.	Negative (titre below 1·8) possible (clinical) Viral Hepatitis ....	4
M.E.T.	Negative (titre below 1·8) past history of Viral Hepatitis years ago .... .... .... .... .... .... .... .... ....	2
Total	.... .... .... .... .... .... .... .... .... ....	40
		—

#### *Forensic*

Serology staff made 10 appearances in Criminal and Police Courts in various parts of the State.

#### *Visits*

Mr. Drummond paid visits during January to the Sydney Hospital and Children's Hospital, Sydney, The Royal Melbourne and Fairfield Hospitals, Commonwealth Serum Laboratories and Public Health Laboratories, Melbourne, to discuss techniques and apparatus.

### PUBLIC HEALTH LABORATORIES, BUNBURY BRANCH

#### Dr. L. Szaloky reports :

There has been a steady increase in the number of specimens received for examination, as shown in the monthly returns submitted, and the area of operation has been found to extend to Margaret River, Bridgetown, Donnybrook and Collie.

The regular weekly visit to Busselton has been maintained.

The variety of work received has expanded in all three branches, most particularly in the fields of biochemistry and bacteriology. (See Table No. 10).

The following species were isolated :—

- 5 Shigella strains
- 4 C. diphtheriae
- 1 Cl. welchii
- 2 Neisseria meningitidis.

As indicated in 1957, the greatest volume of work has been in haematology.

Table No. 10 outlines the work carried out.

### PUBLICATIONS

1. N. Kovacs : A micromethod for detecting indol formation. Journal of Clinical Pathology (in press).
2. N. Kovacs : Salmonellae in desiccated coconut, eggpulp, fertiliser, meat-meal and mesenteric glands : Preliminary report. The Medical Journal of Australia (in press).

### ACKNOWLEDGMENTS

This report would not be complete without thanking the Technical Officer, Mr. A. F. Drummond, for his most enthusiastic co-operation and help in the administration of the laboratories as well as for his invaluable assistance in maintaining the standard of the work, and the staff of the laboratories and office for their co-operation and interest in the work.

NICHOLAS KOVACS, M.D. (Vienna), M.C.P.A.,

*Bacteriologist.*

Table No. 10  
Public Health Laboratories—Bunbury Branch Distribution of Specimens

			Public Health Department	Bunbury District Hospital	Total
<i>Bacteriology</i>					
Blood Cultures	....	....	21	4	25
C.S.F.—(a) micro	....	....	26	12	38
(b) cultures	....	....	15	8	23
Eye and Ear swabs—(a) micro	....	....	16	1	17
(b) culture	....	....	16	1	17
Nasal swabs—(a) micro	....	....	6	2	8
(b) culture	....	....	6	2	8
Throat swabs—(a) micro	....	....	93	18	111
(b) culture	....	....	93	18	111
Sputa—(a) micro	....	....	30	21	51
(b) culture	....	....	30	21	51
Urine—(a) micro	....	....	234	80	314
(b) culture	....	....	178	57	235
Urethral and Vaginal swabs—(a) micro	....	....	21	1	22
(b) culture	....	....	21	1	22
Faeces—(a) micro	....	....	35	23	58
(b) culture	....	....	42	23	65
Pus swabs—(a) micro	....	....	90	12	102
(b) culture	....	....	90	12	102
Wound swabs—(a) micro	....	....	46	13	59
(b) culture	....	....	46	13	59
Burn swabs—(a) micro	....	....	2	....	2
(b) culture	....	....	2	....	2
Fluid serous cavities—(a) micro	....	....	3	....	3
(b) culture	....	....	3	....	3
Lung swabs (P.M.)—(a) micro	....	....	4	....	4
(b) culture	....	....	4	....	4
K.L.B.—(a) throat swabs	....	....	49	10	59
(b) nasal swabs	....	....	16	3	19
(c) direct smears	....	....	12	5	17
Urethral, Vaginal and Cervical smears for N. gonorrhoeae	....	....	35	3	38
Direct smears for Vincent's micro-organisms	....	....	14	12	26
Autogenous vaccine	....	....	14	....	14
Antibiotic sensitivity test	....	....	762	232	994
Faeces—(a) worms and ova	....	....	20	1	21
(b) cysts and amoeba	....	....	3	....	3
Vaginal smears for Trichomonas vaginalis	....	....	....	2	2
Blood films (thick and thin) for Malaria parasites	....	....	8	2	10
M. tuberculosis—Sputa—direct smears	....	....	21	20	41
Cow's pus—direct smears	....	....	1	....	1
Tuberculin skin test (Mantoux)	....	....	8	3	11
Sterility test	....	....	6	3	9
<b>Total</b>	....	....	<b>2,142</b>	<b>639</b>	<b>2,781</b>
<i>Haematology</i>					
Hb estimation	....	....	895	154	1,049
Erythrocytes count	....	....	501	68	569
Leucocytes count	....	....	512	111	623
Differential count	....	....	467	95	562
Blood films	....	....	555	79	634
Reticulocytes count	....	....	18	4	22
Platelets count	....	....	14	8	22
Haematocrits	....	....	47	8	55
Absolute values	....	....	37	5	42
Grouping—(a) ABO	....	....	272	34	306
(b) Rh	....	....	272	34	306
Direct Coomb's Test	....	....	2	1	3
Indirect Coomb's test for Rh antibodies	....	....	69	1	70
Rh antibodies titration	....	....	16	....	16
Bleeding time	....	....	10	5	15
Clotting time	....	....	9	4	13
Clot retraction	....	....	4	4	8
Prothrombin time	....	....	214	40	254
E.S.R.	....	....	117	34	151
Abs. Eosinophils count	....	....	1	....	1
Compatibility test	....	....	128	145	273
Sternal puncture	....	....	4	4	8
Differential count of bone marrow	....	....	5	4	9
<b>Total</b>	....	....	<b>4,169</b>	<b>842</b>	<b>5,011</b>

Table No. 10—*continued*  
*Public Health Laboratories—Bunbury Branch Distribution of Specimens*

			Public Health Department	Bunbury District Hospital	Total
<i>Biochemistry</i>					
Total Protein ....	....	....	82	37	119
Albumin ....	....	....	67	37	104
Globulin and A/G ratio ....	....	....	67	37	104
Glucose ....	....	....	012	34	136
Urea ....	....	....	86	57	143
Uric acid ....	....	....	21	1	22
Chlorides ....	....	....	5	2	7
Cholesterol ....	....	....	14	3	17
Alkaline Phosphatase ....	....	....	101	38	139
Acid Phosphatase ....	....	....	17	12	29
Formaldehyde-stable acid phosphatase ....	....	....	15	10	25
Bilirubin ....	....	....	75	32	107
Van der Berg ....	....	....	56	27	83
Thymol turbidity ....	....	....	61	20	81
Thymol flocculation ....	....	....	52	19	71
Amylase ....	....	....	2	....	2
C.S.F.—(a) Protein ....	....	....	23	11	34
(b) Chlorides ....	....	....	22	9	31
(c) Glucose ....	....	....	21	9	30
Urine—(a) Albumin ....	....	....	57	15	72
(b) Glucose ....	....	....	50	5	55
(c) Urea ....	....	....	7	4	11
(d) Bile Salts ....	....	....	6	3	9
(e) Diastase ....	....	....	7	....	7
(f) Chlorides ....	....	....	5	2	7
(g) Bence Jones' proteins ....	....	....	....	3	3
(h) Osazone test ....	....	....	1	....	1
Faeces—(a) Occult blood ....	....	....	14	15	29
(b) Amylase ....	....	....	4	....	4
Fractional Test Meal ....	....	....	16	4	20
Glucose Tolerance test ....	....	....	26	....	26
Liver Function test ....	....	....	41	19	60
Urea Clearance test ....	....	....	8	3	11
Total ....	....	....	1,131	468	1,599
Total of all Laboratory Examinations ....	....	....	7,442	1,949	9,391

**Appendix III**  
**REPORT FROM THE DIRECTOR, TUBERCULOSIS CONTROL BRANCH**  
**TO THE COMMISSIONER OF PUBLIC HEALTH**

I have the honour to submit this, my tenth annual report to you, sir, on this occasion for the activities of the Branch for the year ended 31st December, 1958.

**(1) RECORDS AND STATISTICS**

STATISTICAL TABLE

Year	Mean Population 1,000s.	Notifications				Number on Register			Prevalence per 100,000	Number Receiving T.B. Allowance	Deaths			Death Rate per 100,000		
		Pulm.	Non-Pulm.	Total	Pulm. per 100,000	Pulm.	Non-Pulm.	Total			Pulm.	Non-Pulm.	Total	Pulm.	All Forms	
1950	558	586	18	604	104.8	2,100	....	2,100	376	....	515	125	3	128	22.4	22.9
1951	580	467	37	504	80.4	2,402	75	2,477	413	426	474	76	6	82	13.1	14.1
1952	601	508	49	557	84.4	2,574	94	2,668	428	444	396	75	7	82	12.5	13.6
1953	621	378	34	412	60.6	2,762	120	2,882	445	464	361	43	3	46	6.9	7.4
1954	640	348	34	382	54.3	2,769	97	2,866	432	447	326	57	4	61	8.9	9.5
1955	659	413	39	452	62.7	2,965	128	3,093	450	469	330	31	2	33	4.7	5.0
1956	677	424	44	468	62.6	2,900	146	3,046	428	457	264	43	3	46	6.3	6.8
1957	692	332	32	364	47.9	2,786	156	2,942	403	425	198	36	1	37	5.2	5.3
1958	706	355	24	379	50.3	2,726	82	2,808	386	398	213	22	4	26	3.1	3.4

The annual mortality rate for pulmonary tuberculosis has fallen to 3.1 per 100,000 of the population, that for all forms of tuberculosis to 3.4. There were only four deaths from pulmonary tuberculosis in the under 50 age group, seven in the 50-59 age group.

The number of notifications of pulmonary tuberculosis during the year increased to 355, the increase of 21 notifications being due to increased case finding activities during the year, and follow-up of the previous year's activities. The figure includes 23 re-notifications and 19 transfers.

Of the 355 notifications, 259 were males and 96 were females.

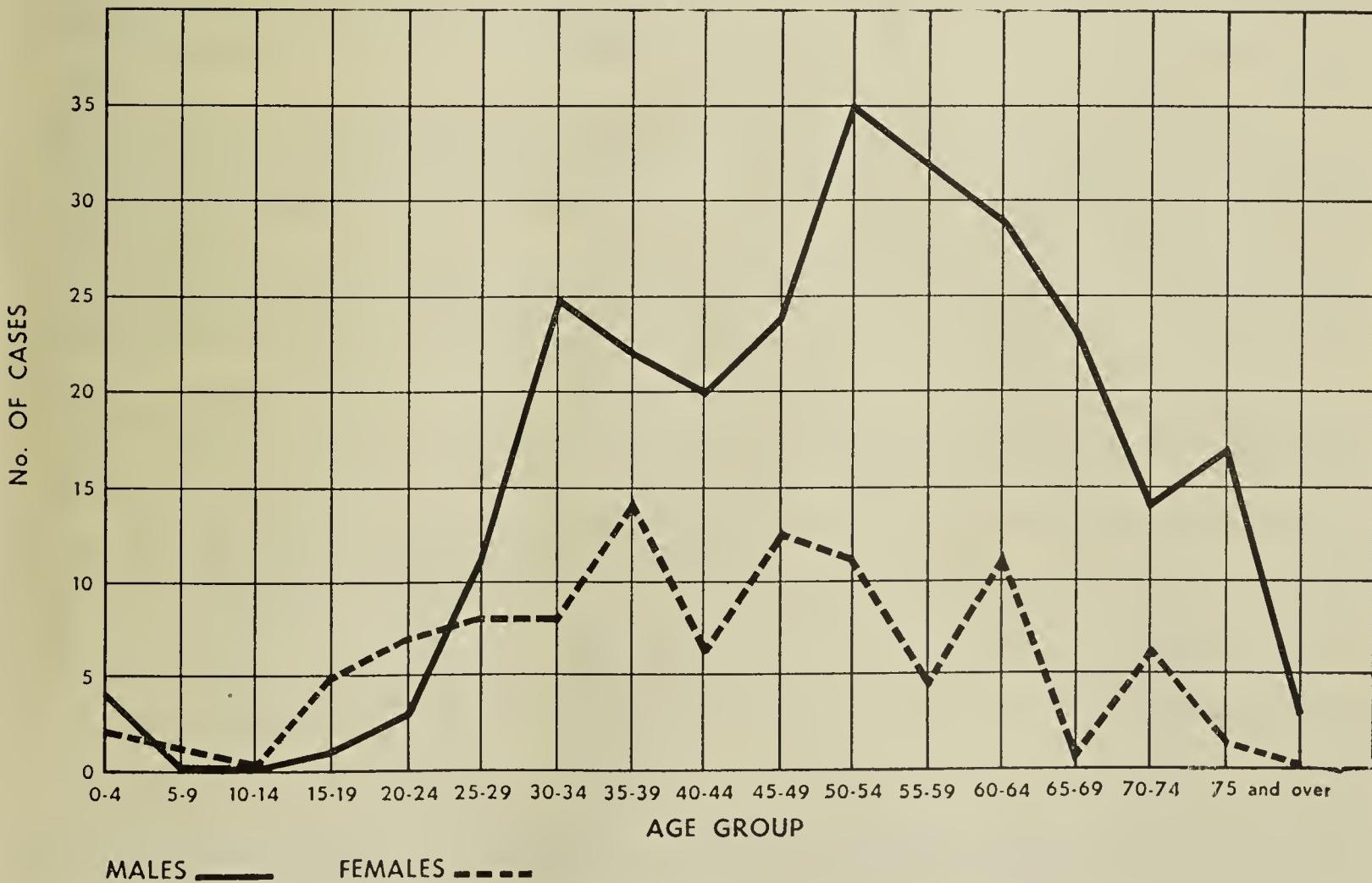
Of the males, 55 were notified suffering from disease "Minimal" in extent; 140 "Moderately Advanced," and 60 "Advanced"; and four were pleural effusions.

Of the females, 36 were "Minimal"; 47 "Moderate" and 12 "Advanced"; and one pleural effusion.

There were only six notifications under the 15-20 years age group; one boy of 18 years and five girls, one of 15 years, two of 18 and two of 19 years respectively.

The maximum incidence of the disease in men was as in previous years in the 45-65 age group; in women, the distribution now appears to be more evenly spread over the 25-65 age group.

**GRAPH SHOWING AGE DISTRIBUTION OF PULMONARY TUBERCULOSIS NOTIFIED IN 1958**



Although the percentage of pulmonary tuberculosis discovered in the early or "Minimal" stage had been increasing up till 1956, a noticeable reversal of this trend has now been disclosed, confirming the clinical impression that an increased number of sufferers with more extensive disease were again coming to light.

*Annual Notification of Pulmonary Tuberculosis showing Stage of Disease\**

Year	Percentage of Parenchymal Disease						Total	Pleural Effusion as per cent. of Total
	Minimal	Moderately Advanced	Advanced	Total	Pleural Effusion as per cent. of Total			
1952	122	24%	275	54·1%	101	19·9%	508	10·2%
1953	98	25·9	210	55·5	65	17·2	378	5·1·4
1954	96	27·6	178	51·1	74	21·3	348	....
1955	111	26·9	225	54·5	64	15·5	413	13·3·1
1956	127	38	217	51·1	72	17	424	8·1·9
1957	102	30·7	163	49·1	61	18·4	332	6·1·8
1958	91	25·6	187	52·7	72	20·3	355	5·1·4

\* Classified according to Diagnostic Standards N.T.A.

The number of sufferers from pulmonary tuberculosis on the Case Register at 31st December, 1958, dropped to 2,726, and for the first time since the increased case finding activities of the Branch, the prevalence of the disease has fallen below 400 per 100,000, the figure for pulmonary tuberculosis now being 386, the continuation of a downward trend since 1955.

Of 557 removals from the Case Register during the year, 343 were considered to have been Inactive for a sufficient period to be regarded as cured; \*\* there were 59 transfers out of the State; a revised diagnosis was made in 52 instances; seven were untraceable, and there were 96 deaths from all causes (26 due to tuberculosis and 70 from other causes).

It should be noted here that there have been 1,299 persons removed from the Case Register in the last five years, in which the disease has been considered cured.

An analysis of the country of origin of all tuberculosis patients was made during the year and the Case Register at 31st December, 1958, showed :—

- 62 per cent. Australian born
- 20 per cent. British born
- 15 per cent. European born
- 1 per cent. Asiatic
- 2 per cent. (Unknown)

Of the 379 Notifications during the year :—

- 53 per cent. were Australian born
- 45 per cent. born outside Australia (25 per cent. arrived before 1948, and 20 per cent. since 1948).
- 2 per cent. (Unknown).

The Notification rate or incidence was 99 per 100,000 of the migrant population, as against 38 per 100,000 of the Australian population, based on the fact that 25 per cent. of the population of Western Australia at 31st December, 1958, was classified as migrant.

At the end of the year, 213 persons were receiving the Commonwealth Tuberculosis Allowance, 172 males and 41 females, a slight increase on the previous year.

During 1958, a total of 168,853 micro X-Ray films were taken, bringing the total to date since 1948 to 904,800 (excluding routine hospital microfilm examinations).

A total of 11,800 17 x 14 films were taken at the Perth Chest Clinic, bringing the total of these examinations at the Clinic to 119,200.

Since compulsory surveys commenced in 1952, there has been, as would be expected, a gradual decline in the mass radiography findings, as shown by the tables below :—

*Mass Surveys*

(All surveys including Compulsory, Voluntary, National Service Trainees, Special Surveys)

Year	No. of Micros.					Significant T.B.	Per 1,000 X-Rays
	1952	1953	1954	1955	1956		
1952	....	....	....	....	....	61,339	145 2·4
1953	....	....	....	....	....	61,370	117 1·9
1954	....	....	....	....	....	95,173	109 1·1
1955	....	....	....	....	....	138,433	178 1·3
1956	....	....	....	....	....	131,410	181 1·4
1957	....	....	....	....	....	144,801	120 .8
1958	....	....	....	....	....	168,853	116 .7

\*\* Using the generally accepted criterion of disease being Inactive for five years—or more recently, three years, when diseased tissue has been completely resected and using N.T.A. Classification for Inactive disease 1950.

*Compulsory Surveys (Only)*

Year	No. of Micros.	Significant T.B.	Per 1,000
			X-Rays
1952	16,352	72	4.4*
1953	20,510	43	2.1
1954	54,285	85	1.6
1955	96,504	130	1.3
1956	92,503	152	1.6
1957	113,552	86	.8
1958	135,283	98	.7

\* Includes 1st Survey of Goldfields.

(2) PREVENTION

Full scale activities by visiting nurses were continued in the Metropolitan area and at Kalgoorlie. The Clinic sisters carried out 4,290 visits to 1,796 out-patients living in Perth and Fremantle, and 765 visits to 180 out-patients at Kalgoorlie.

There were only eight patients with positive sputum in the Metropolitan area and one at Kalgoorlie living under "approved home conditions."

Four hundred and sixty-seven out-patients in the Metropolitan area and 56 at Kalgoorlie, were receiving domiciliary chemotherapy at home (usually a combination of Isoniazid and P.A.S.).

The visiting nurses continued the responsibility of arranging chest X-Rays and Mantoux tests in children, in "contacts" of new and old notified tuberculosis sufferers.

Attention was again paid to improvement of living conditions of patients when necessary, but it would appear that the general level of housing in the community has reached a high standard; liaison with the State Housing Commission was only necessary to obtain new accommodation in six instances.

*B.C.G. Vaccination*

The use of this vaccine was again restricted by recommendation of the National Tuberculosis Advisory Council and it was administered only to negative Mantoux reactors amongst National Service trainees, hospital staff and contacts of known tuberculosis patients.

This year the number of Mantoux tests and B.C.G. vaccinations performed was much less than recent years, as the programme of testing and vaccination of school-leavers was abandoned, following a decision of the Council.

Two thousand six hundred and sixty-three Mantoux tests were performed and 944 vaccinations carried out with the dried B.C.G. product.

A poor conversion rate was noted at the beginning of the year, but following correspondence with the Commonwealth Serum Laboratories, the vaccine was forwarded packed in "ice" and from the last 703 vaccinations, a satisfactory conversion rate of 93 per cent. was obtained.

*"Morrison" Preventorium*

Of the 32 infants admitted during the year with tuberculous parents, 29 were new born babies from mothers receiving treatment, or where isolation and B.C.G. vaccination of the baby was still considered necessary.

Since Morriston was opened in November, 1950, there have been 325 admissions (till 31st December, 1958).

*Action under Sections 293 and 294 of the Health Act*

Thirty-four persons were "required to submit to x-ray examination for tuberculosis," of these 28 reported for chest x-ray, of whom one was re-admitted to hospital and 27 resumed out-patient supervision. In regard to the remaining six, one prosecution is pending, one is untraceable, and the remaining four have not been finalized.

Two persons "suffering from communicable tuberculosis not conducting themselves to preclude infection of other persons" were directed to enter an institution for treatment, and subsequently did so.

(3) CASE FINDING

(i) *Mass Radiography*

The second compulsory mass chest x-ray survey of the Metropolitan area was continued with completion of surveys of Perth Road Board, Fremantle, Mosman Park, Cottesloe, North Fremantle, East Fremantle, Claremont, Peppermint Grove, Nedlands, Subiaco and the City of Perth.

A total of 96,944 micro films‡ were taken in this series with a finding of .67 persons with significant pulmonary tuberculosis per 1,000 individuals examined.

Further country surveys were carried out in the Municipalities of Albany, Bunbury and Geraldton, and the Road Board Districts of Busselton, Denmark, Manjimup, Woodanilling, Tableland, Nullagine, Marble Bar, Yalgoro, Mt. Magnet, Black Range, Cue-Day Dawn, Meekatharra, Wiluna, Leonora, Laverton, Menzies, Drakesbrook and Harvey† (in forty-one centres).

A total of 38,339 micro films‡ were taken in this series with a finding of .78 persons with significant pulmonary tuberculosis per 1,000 examined.

‡ Mostly 35 mm. (some 70 mm.) Mirror Camera films.

† Centres.—Agnew, Albany, Brunswick Junction, Bunbury, Busselton, Cue, Deansmill, Denmark, Geraldton, Gwalia, Harvey, Kentdale, Laverton, Leonora, Manjimup, Marble Bar, Meekatharra, Menzies, Mt. Ida, Mt. Magnet, Mt. Many Peaks, Mt. Margaret Mission, Noreena Downs, Northcliffe, Nullagine, Nyamup, Palgarup, Pemberton, Port Hedland, Quinnyup, Roy Hill, Sandstone, Shannon, Tone River, Walpole, Waroona, Wiluna, Wittenoom, Woodanilling, Yalgoro, Yarloop.

(ii) *Referral by Medical Practitioners to Perth Chest Clinic*

(a) *Metropolitan Area*

There was a slight drop to 3,430 in the number of patients referred (2,368 large films and 1,062 micro films). The incidence of .47 per cent., or approximately 1 in 200 of this group, was approximately the same as during 1957. Again, it is considered the compulsory Metropolitan surveys had a modifying effect on the numbers referred to the Clinic.

(b) *Country Areas*

There was a slight decrease in the number of films referred from country practitioners to 7,120, probably due to mass surveys in major centres. However, the value of this consultative service was again shown by the fact that 16 patients were discovered suffering from significant pulmonary tuberculosis—a rate of 2.24 per 1,000 ; apart from 26 further suspects and 663 other abnormalities.

Drs. A. E. Vivian of Albany, W. Lawson Smith of Bunbury, J. R. Hankey of Collie, A. J. Beaumont of Geraldton, A. McL. Robinson of Northam and W. J. Grey of Merredin, continued to support the work of the Department as Tuberculosis Officers in these districts.

(iii) *Routine Hospital Chest X-Ray Examinations*

The Superintendent reports that no systematic micro film work was carried out at the Royal Perth Hospital during 1958 due to pressure of work on the Department of Radiography, but 932, 35 mm. films were taken, as well as a number of 17 x 14 films. The value of case finding in the general hospital was, however, shown insofar there were 14 sufferers from active pulmonary tuberculosis diagnosed during the year.

At the Fremantle Hospital, due to building alterations, only 432, 35 mm. films were taken, but there were 2,818 17 x 14 films ; and a total of eight pulmonary tuberculosis sufferers were diagnosed.

At the St. John of God Hospital, Subiaco, there were 2,534, 35 mm. micro film examinations, but no cases of tuberculosis were disclosed.

At the King Edward Memorial Hospital, 1,324 35 mm. micro films (lens system) were carried out on ante-natal patients ; only a few minor abnormalities were noted. In the last two months of the year, routine Mantoux tests were carried out on 183 patients, reducing the number undergoing routine chest x-ray to approximately 40 per cent. of these patients i.e. those who had positive Mantoux reactions.

(iv) *Migrants*

The Commonwealth Health and Immigration and Customs Departments have again assisted in the evaluation of tuberculosis in new arrivals by distribution of pamphlets to ships arriving at Fremantle, provision of figures, lists and x-ray films of assisted migrants.

There were 14,055 arrivals during the year, comprising 8,419 British full fare paying passengers, 2,702 assisted British migrants and 2,934 Aliens.

A total of 1,965 large films of migrants were submitted for re-check, and 2,324 reported for chest x-ray\* examination as a result of receipt of pamphlets on arrival.

During the year, there were 73 notifications of pulmonary tuberculosis in migrant arrivals since 1948, comprising British full fare 20 ; British assisted 9 ; Aliens 35 ; British seamen 7 ; and Alien seamen 2.

These 73 notifications resulted from voluntary and routine chest x-ray 13 ; compulsory chest x-ray surveys 23 ; referred by medical practitioners 8 ; reporting as a result of pamphlet 1 ; transfers from overseas or interstate 8 ; under observation for over one year 7 ; admitted to Fremantle Hospital direct from ship 7 ; applicant for mining industry 1 ; referred by hospital 3.

Of these 73 notifications, 14 arrived during 1958, consisting of British full fare 1 ; British assisted 3 ; Italian 1 ; British seamen 5 ; Indian seamen 1 ; Ukrainian 1.

Eighteen of these were admitted to hospital.

More careful research was carried out this year on country of birth of notified patients and those already on the Register (see Statistics), and we are now aware that the incidence of tuberculosis in migrants is more than double that of the Australian born population and that the prevalence of tuberculosis in the two groups is also consistent with this finding.

All these case finding activities must be evaluated not only from the disclosure of tuberculosis sufferers, but from all the "by-products," the findings of numerous other abnormalities, one of which is now not a by-product but unfortunately a regular definite finding of cancer of the lung.

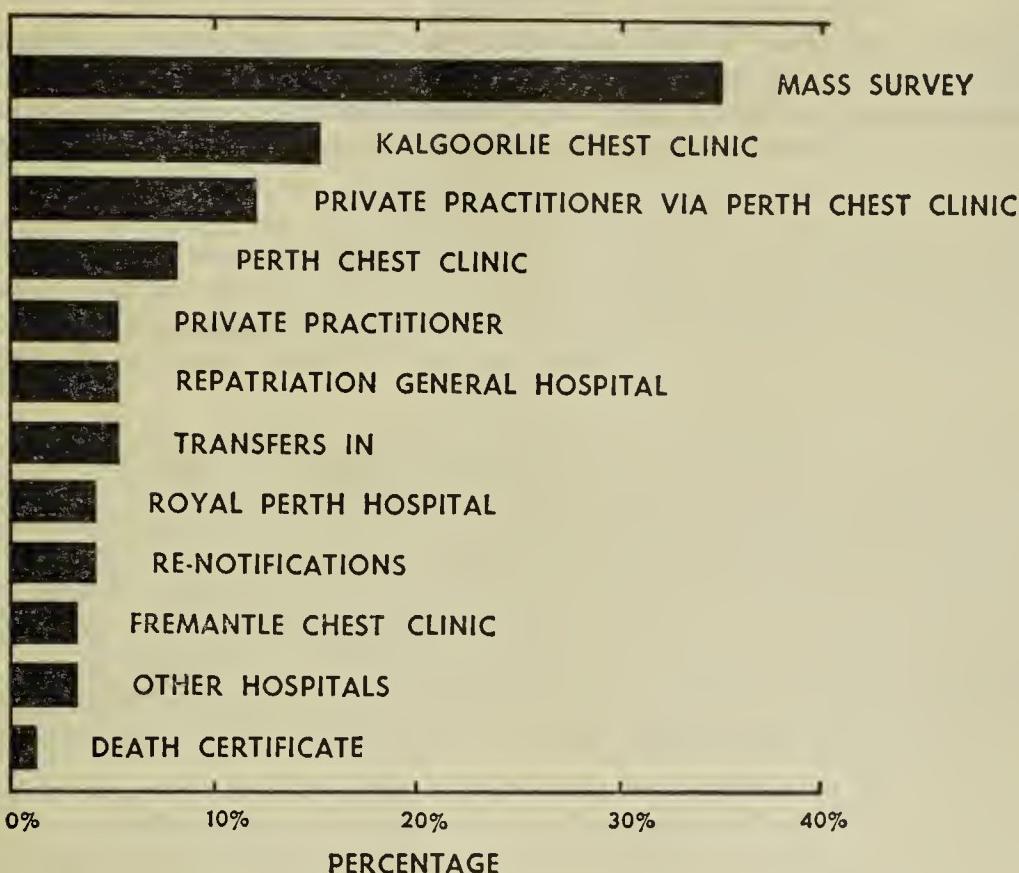
In mass surveys, for every three of four persons found to have active pulmonary tuberculosis, there is one found to have pulmonary carcinoma, and in patients referred to Clinics with chest symptoms at the present time the findings are about equal.

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\* All Clinics and country hospitals.

**GRAPH SHOWING THE SOURCE OF NOTIFICATION OF CASES  
OF PULMONARY TUBERCULOSIS AS PERCENTAGE OF  
TOTAL NOTIFICATIONS.**

1958.



**(4) MEDICAL CARE AND ISOLATION**

Treatment now follows more or less well determined lines, using Streptomycin, Isoniazid and P.A.S. with the added refinements of testing the infecting *Mycobacterium tuberculosis* in each patient for drug sensitivity.

As mentioned in Dr. Elphick's following report, 90 per cent. of the patients become non-infectious within three months ; surgery is now less frequently indicated due to the "sterilization" of the disease process in the lungs achieved by the long term chemotherapy. The latter is continued well after discharge of the patient from hospital for usually eighteen months to two years, with the result that relapse of disease is now relatively infrequent.

Where surgery is still indicated, it is now usually a case for segmental resection of residual disease process where drug treatment has failed to control the infectious nature of the disease.

*Repatriation General Hospital, Hollywood*

Up to the time of the transfer of female civilian patients to the Perth Chest Hospital, an additional 13 patients were admitted to the Repatriation General Hospital, making a total of 18 patients receiving treatment at this Hospital up to 8th October, 1958. I would like to express my appreciation here to the Repatriation Commission for the use of these beds over the years during the shortage of accommodation for patients.

*Royal Perth Hospital*

There were 71 patients admitted during the year with tuberculosis of some form or other, including 34 from Wooroloo Sanatorium for surgical procedures prior to the opening of the Perth Chest Hospital.

There were 36 transfers back to Wooroloo, 10 to the Chest Hospital, three to the Repatriation Hospital, two to Claremont Mental Hospital and one to Fremantle Hospital, apart from 21 discharged home.

*Fremantle Hospital*

There were 13 patients with tuberculosis admitted, including three transfers from Wooroloo ; six patients returned to Wooroloo, one went to the Chest Hospital, and eight were discharged.

*Princess Margaret Hospital for Children*

There were only seven children admitted during the year, four with significant primary lung lesions, and three with tuberculous glands of the neck.

Thirteen children under the age of eight years with positive Mantoux tests were given prophylactic Isoniazid and Para-aminosalicylic acid as out-patients.

*Claremont Mental Hospital*

There were 63 patients in the Tuberculosis Block at 31st December, 1958, comprising 38 males and 25 females, but actually only 13 still in need of treatment, of whom four were still sputum positive.

### *Out-Patients Clinics*

#### *Perth Chest Clinic.*

Medical Clinics by appointment were held on three mornings of the week, and the Surgical Clinic once a week. Details are given in Dr. Heymanson's following report. Attendances were comparable with recent years.

#### *Fremantle Chest Clinic.*

A Clinic was held one morning a week, and attendances averaged one less than the previous year. The number of patients referred by general practitioners dropped from 486 the previous year to 320; probably due to the mass surveys carried out in the Fremantle district. However, mainly as a result of the latter, the total number of patients notified from this Clinic during the year increased from 16 to 26.

#### *Kalgoorlie Chest Clinic.*

Despite intensive effort since 1952, the amount of tuberculous infection in the Goldfields is still much greater than it should be in relation to the relatively small population. However, the Clinic Chest Physician, Dr. McNulty, has worked very hard on the problem and in his second year has achieved more satisfactory supervision, and it is to be hoped that future years will produce some control of the problem.

I include herewith Dr. McNulty's report for 1958 :—

"During 1958, all miners accessible to the Clinic with abnormal chest x-rays were examined and investigated. Where indicated, investigation included admission to hospital. These examinations will be extended later to include other mining centres in conjunction with the Mobile X-Ray Unit.

The routine examinations revealed seven miners and 25 ex-miners with tubercle bacilli in sputum or gastric contents. The vast majority of those investigated showed no evidence of active pulmonary tuberculosis on bacteriological examination, despite suggestive radiological changes and symptoms. Unfortunately, it is an accepted fact that a number of these will develop active tuberculosis. The problem is to decide which pulmonary diseases are due to a combination of silicosis and non-specific infection, and which are due to silicosis and latent tuberculosis, so that treatment may be initiated before the disease becomes active and infectious.

There are two groups whose progress may help to answer the problem :

1. Miners investigated with negative results, still working in the industry.
2. Ex-miners with progressive silicosis, radiologically suggestive of tuberculosis but unproven bacteriologically, who are being treated with anti-tuberculous drugs.

Total number of X-Rays of miners examined .... .... .... .... 7,233

Total number of miners requiring special supervision .... .... ..... 238

The routine work of the Clinic, exclusive of miners, is greatly assisted by the co-operation and kindness of the private practitioners. Every chest x-ray taken in the area is examined and further investigated if necessary, e.g., seven cases of bronchogenic carcinoma were diagnosed at initial examination or on follow-up. Routine tuberculin testing of children referred to the Clinic with chest symptoms revealed a number of children under the age of four years with a positive mantoux, who are being treated with prophylactic chemotherapy."

Number of notified cases on the Register	....	....	....	....	....	....	192
Number of new notifications (includes cases not on this Register)	....	....	....	....	....	....	73
Number of cases removed from Register	....	....	....	....	....	....	18
Number of chest x-ray examinations	....	....	....	....	....	....	2,871
Number of admissions to Repatriation General Hospital	....	....	....	....	....	....	28
Number of admissions to Wooroloo and the Chest Hospital	....	....	....	....	....	....	35
Number of admissions to Kalgoorlie District Hospital	....	....	....	....	....	....	28*

\* Sixteen of these were subsequently transferred to hospital in Perth.

#### *Laboratory*

The tuberculosis Laboratory functioned as a separate unit at the Perth Chest Clinic until the opening of the Chest Hospital, when it transferred to the Hospital and is now integrated as part of the Public Health Laboratories. Police escort was arranged for transfer of the active cultures of tubercle bacilli. Mr. Foley, Senior Technician, is to be complimented on the smoothness of this complicated transfer of equipment carried out without interruption of diagnostic facilities.

Perth and Fremantle Clinic records show the following work referred to the Laboratory from the Clinics :—

		No. of Tests	Individuals
1. Sputum Examinations	....	1,337	508
Positive for M. tuberculosis	....	58	32
2. Gastric contents	....	364	149
Positive for M. tuberculosis	....	61	27
3. Laryngeal Swabs	....	341	164
Positive for M. tuberculosis	....	4	4

The above figures are lower than the previous year, but exclude specimens sent direct from the country and metropolitan hospitals. A fuller report of the Tuberculosis Laboratory will be found in the report of the Director of Public Health Laboratories.

### *Dental Clinic*

The Dental Clinic at the Perth Chest Clinic staffed by a Dental Officer of the Perth Dental Hospital, functioned once a month now mainly for continuation of work commenced in Wooroloo, or the Perth Chest Hospital. There were 53 visits from 35 patients and 106 procedures carried out.

### (5) SOCIAL AND ECONOMIC PROTECTION

The Tuberculosis Allowance rate remained at £10 7s. 6d. per week for the married sufferer with dependent wife, plus 10s. for each dependent child ; £4 7s. 6d. per week for the single sufferer in hospital and £6 10s. for the latter undergoing domiciliary treatment. Permissible other income remains at £7 per week for married male patients (between husband and wife) and £3 10s. per week for single persons.

This year there was an increase in the number receiving the Allowance at 31st December, 1958, when compared with the end of the previous year, for the first time since the Allowance has been instituted.

At 31st December, 1958, there were 218 persons in receipt of the Allowance, comprising 173 males (120 in hospital) and 45 females (25 in hospital). One hundred and eighty two of the number were Australian born, 36 were migrants (comprising 17 Displaced persons, 12 European, five English, one Anglo-Indian and one Filipino).

### (6) AFTER-CARE AND REHABILITATION

The necessity for rehabilitation seems to have levelled off and is now only required for some five per cent. of admitted patients, as the vast majority of patients are now able to return to their previous occupation or duties. The Senior Medical Officer, Dr. Tomlinson, and Rehabilitation Officer, Mr. Perry, of the Commonwealth Department of Social Services, working in conjunction with our medical staff, report that 24 patients were interviewed, 14 commenced training and 11 were placed in employment during the year, and that there were 14 in training at 31st December, 1958.

The officer in charge of the Physically Handicapped Section of the Commonwealth Employment Service, Mr. Hitchman, reports that 29 ex-tuberculosis patients were helped obtain employment in the twelve month period (including some referred from the Repatriation Department).

The Tuberculosis Association of W.A. again continued its main activity in the rehabilitation sphere, and the Assistant Tuberculosis Physician, Dr. Edwards, who acts as Medical Adviser to the Federal Cardboard Box Company, reports nine ex-patients employed at 1st January, 1958, 24 employed during the year and nine employed as at 31st December, 1958.

### (7) DEVELOPMENTS

The work of years culminated on the 22nd August with the admission of the first patients to the Perth Chest Hospital.

The Hospital was officially opened on 1st September, by the then Premier of the State, the Hon. A. R. G. Hawke, in the presence of the Commonwealth Minister for Health, Dr. the Hon. D. A. Cameron.

At this date, three of the eight 27-bed wards were functioning, and six weeks later two more wards were occupied, which was all that was possible due to staff limitations at the close of the year.

The opening of the new Hospital will (when fully open) completely solve the bugbear of the waiting list of patients for admission.

An important aspect of the new Hospital has been the establishment of a Pulmonary Function Laboratory. Much recent medical progress has been made in the realm of respiratory physiology, and this has a considerable bearing in the assessment of treatment and prognosis in lung disease, both from infective (such as tuberculosis) and mechanical cause (such as silicosis).

Dr. Heymanson, who returned in August from an extensive post-graduate tour, is now specially trained and well equipped to keep this State to the forefront in this field.

The Wooroloo Sanatorium, as you know sir, has reverted to your administrative control, and it is expected that the number of tuberculosis patients at 31st December, 1958, namely 91 (86 male and five female) will gradually diminish to a residuum of elderly and chronic patients in keeping with the planned geriatric nature of the hospital.

The other major development during the year was the extension of the Commonwealth-State Arrangement for the campaign against tuberculosis for a further period of five years to the 30th of June, 1963.

This was ratified by an Act of the State Parliament in November and the Agreement was also signed by the Rt. Hon. R. G. Menzies, the Prime Minister, and the Hon. A. R. G. Hawke, the Premier, in that month.

Briefly, the arrangement is that the Commonwealth and State will combine to participate in a campaign to reduce the incidence of tuberculosis in Australia, and provide adequate facilities for the diagnosis, treatment and control of tuberculosis ; and the Commonwealth will reimburse the State for all maintenance expenditure, above the level of the base line 1947-48 ; and will provide any capital expenditure necessary for the purposes of the campaign.

In regard to the mass radiography campaign, an effort has always been made to achieve the highest degree of technical efficiency, using modern x-ray machines and to minimize any possible radiation hazard. Public interest in the latter, enhanced by nuclear weapon tests, was however reassured by the report to the Prime Minister by the National Radiation Committee in July of the year; which "recommended continuation of mass surveys ; that the risk of detectable effects on the population and on the individual from mass x-ray surveys is very small indeed and should be accepted at the present time."

All possible steps, however, were taken when necessary on x-ray units to reduce radiation, with provision of proper coning of x-ray beams including light beam diaphragms, proper filtration by 2-3 mm. aluminium filters in the x-ray beam, and provision of shielding with plastic lead shields where necessary, to exclude or minimize radiation to any other portion of the body other than the chest.

## CONCLUSION

The year has shown further progress in tuberculosis control, satisfactory trends in a decreasing mortality rate and now a decreasing morbidity rate have been achieved in spite of the "loading" in this State of the disease in migrants and gold miners.

The mortality rate for pulmonary tuberculosis which had become fairly stabilized over the last six years at a very low level, has in fact fallen even lower to the record figure of 3·1 per 100,000\* of the population.

Treatment facilities are now eminently adequate, with the opening of the Perth Chest Hospital. However, the incidence of the disease, although halved since 1950 (with more consistent control measures figures may be considered comparable since 1950) still remains a problem, suggesting that some gaps remain in our case finding problem, and that our knowledge of the epidemiology and methods of tuberculosis control is not yet complete.

There has been some misplaced optimism expressed by some members of the community, even members of the medical profession, that the battle against tuberculosis is already won, but this is not yet so. The community cannot yet afford any complacency. Existing methods of control of this infectious disease must be continued and re-evaluated to achieve further success if the goal of eradication is to be attained.

From the results already achieved, the expenditure in tuberculosis control measures under the Commonwealth-State Arrangement would appear to be more than justified, both from the humanitarian and the economic viewpoints.

### *Acknowledgments.*

In conclusion, I would again like to express my thanks for the co-operation of the Repatriation Commission, especially Dr. W. Harris, Chest Specialist; to all members of the staff of the Branch in a difficult year due to increased activities and newer developments, particularly to Dr. Elphick, Matron Anstey and Mr. A. Thomson, for their splendid achievement in the team-work required for the opening of the Perth Chest Hospital; and also to Dr. F. Heymanson, the Tuberculosis Physician, Matron K. Cockerell of the Chest Clinic, and Dr. F. G. B. Edwards, the Assistant Tuberculosis Physician, for their sterling support.

I would also like on this occasion, after the satisfactory "launching" of the Chest Hospital, to express my thanks to the Principal Architect, Mr. A. E. Clare, and my especial appreciation of the work of Mr. S. Cann, Senior Architect of the Public Works Department, Architect on the job, for the part he played in the designing and co-ordinating of the construction of the project. I would like to acknowledge with thanks the work of the senior engineering and electrical officers of that Department, Mr. J. Shirley, Mr. I. Metcher and Mr. N. Saunders, not forgetting the arduous work in the latter stages of the furniture officer, Mr. J. Spencer.

Your encouragement, and that of the Under Secretary, Mr. Devereux, are also acknowledged.

The reports to me sir, of Dr. Elphick, who transferred as Superintendent of Wooroloo Sanatorium to the Perth Chest Hospital, and Dr. Heymanson, the Tuberculosis Physician, are attached.

ALAN KING, B.Sc., M.B., B.S., F.C.C.P.,  
*Director, Tuberculosis Control Branch.*

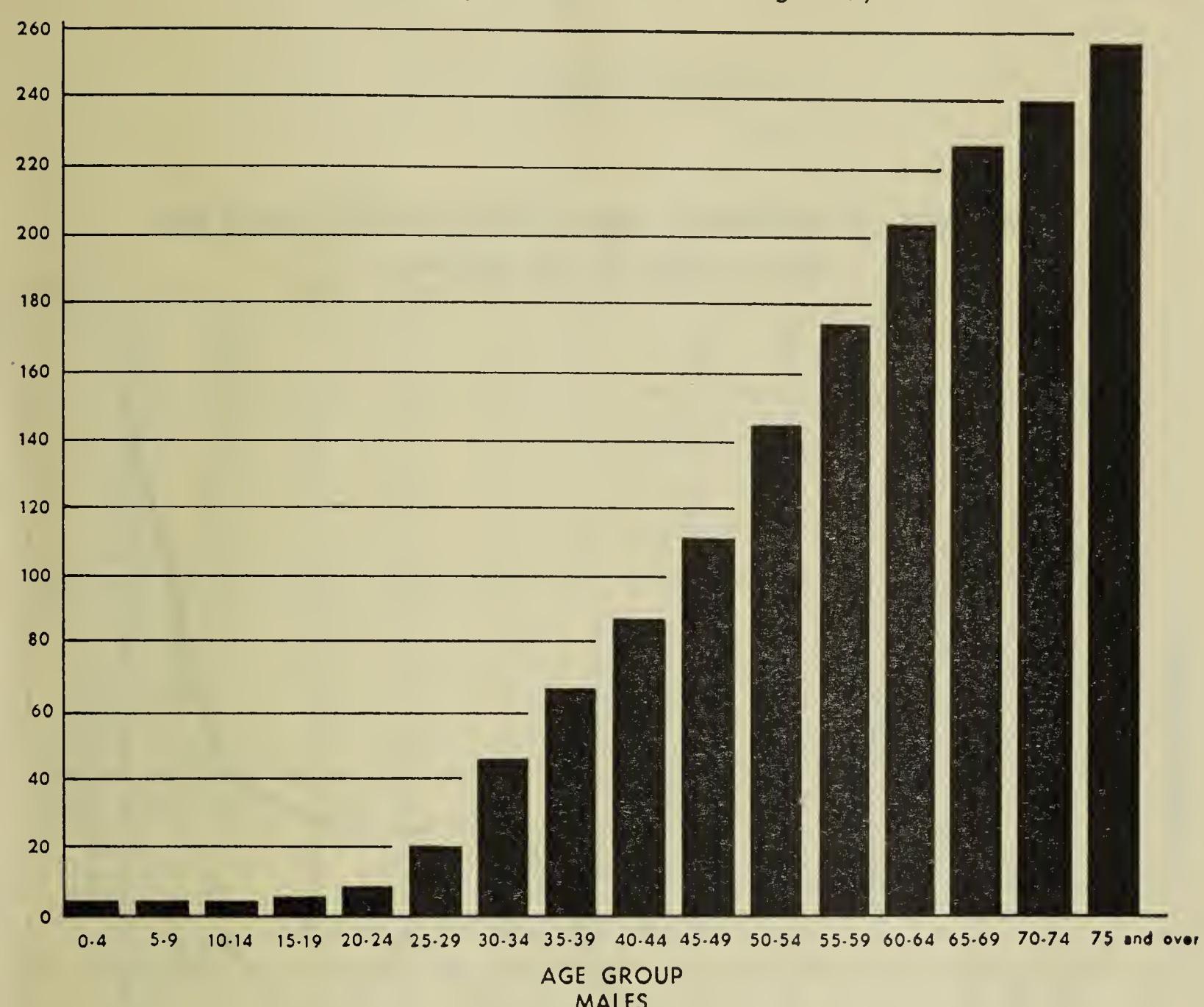
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\* Comparable other figures are (for 1957) : Canada 7·8, Denmark 5·1, Hong Kong 102·6, Norway 10·2, Sweden 9·6, Singapore 57·8, United States 7·5, England and Wales 12, Scotland 12.

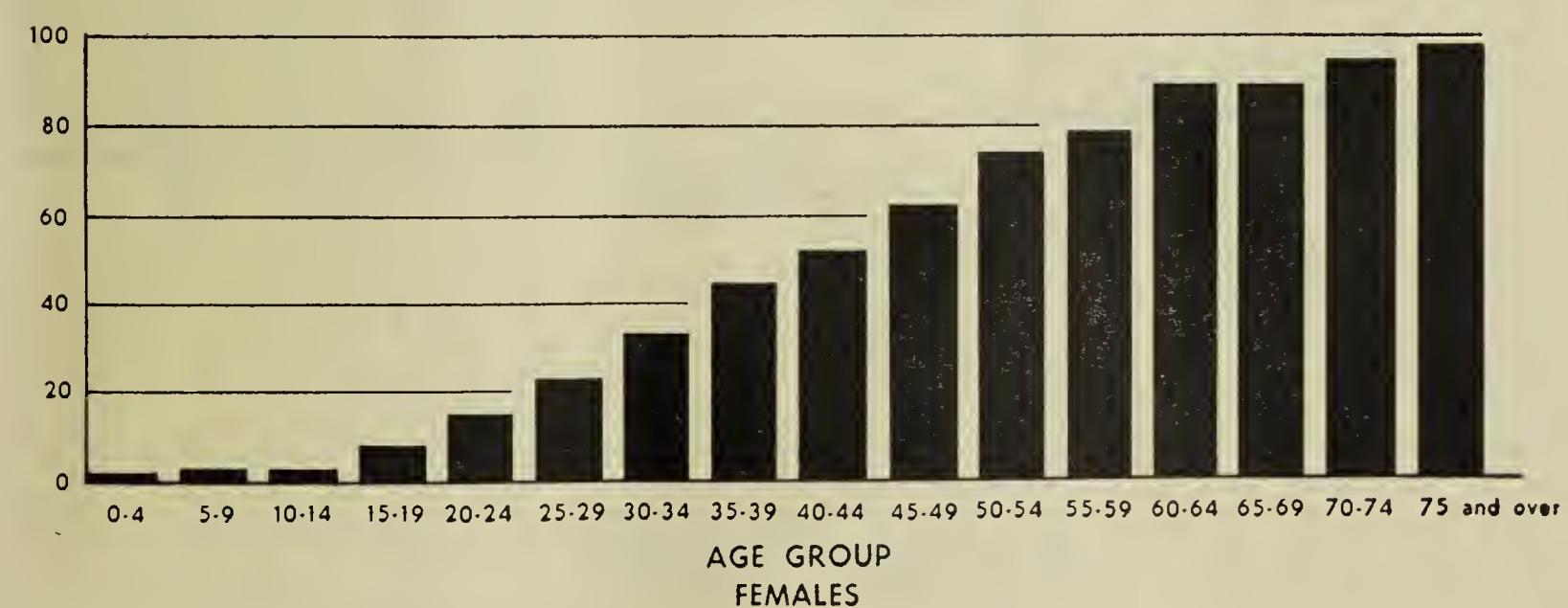
## CASES OF PULMONARY TUBERCULOSIS NOTIFIED IN 1958

### PROGRESSIVE TOTALS AT EACH AGE GROUP

(Each column represents all persons aged up to and including the specified age group who were notified during 1958.)



AGE GROUP  
MALES



AGE GROUP  
FEMALES

**NEW CASES OF PULMONARY TUBERCULOSIS NOTIFIED DURING 1958**  
**Rate per 1,000 in each Age Group**

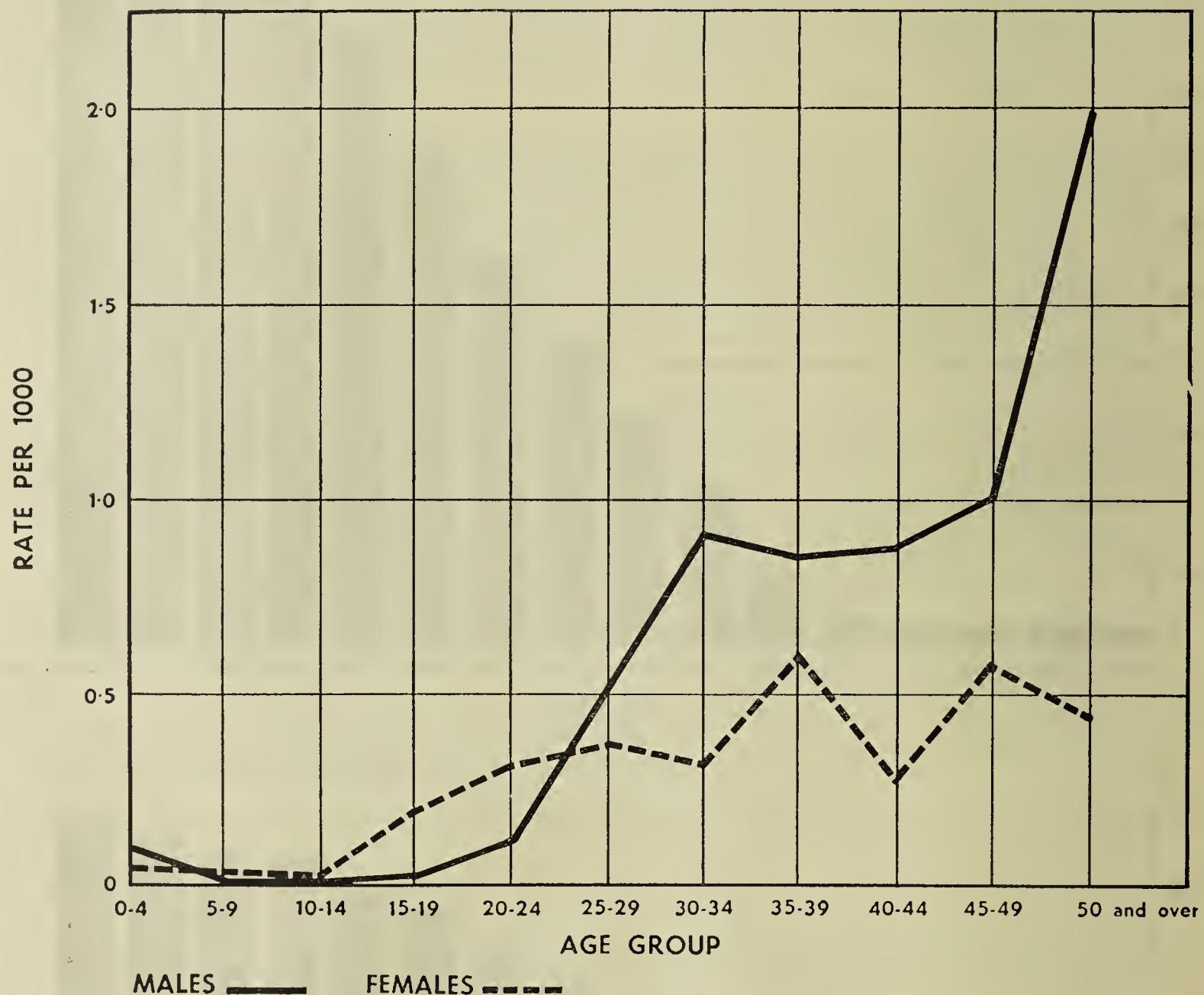


TABLE I

## State of Western Australia

## TUBERCULOSIS NOTIFICATIONS FOR THE YEAR ENDED, 31ST DECEMBER, 1958

Showing Age, Sex, Form and Stage of Disease

Age Group	Males				Females				Persons			
	Pulmonary		N.P. T.B.	Pleural Effusion	Pulmonary		N.P. T.B.	Pleural Effusion	Pulmonary		N.P. T.B.	Pleural Effusion
	Min.	Mod.			Min.	Mod.			Min.	Mod.	Adv.	
0-4	2	1	1	1	2	1	1	1	4	1	1	10
5-9	...	...	...	...	...	...	...	...	1	2	2	3
10-14	...	...	1	1	3	2	3	2	3	1	3	...
15-19	...	...	1	1	3	3	1	1	3	2	3	9
20-24	2	1	2	1	5	2	1	1	9	5	2	10
25-29	4	3	1	1	2	4	9	1	14	17	2	22
30-34	12	11	3	2	1	2	1	1	10	20	4	35
35-39	6	7	2	1	2	3	2	1	8	10	8	2
40-44	5	8	7	2	3	4	6	2	12	24	4	36
45-49	4	18	2	1	1	3	3	1	1	8	1	30
50-54	9	16	7	7	1	1	3	8	1	1	1	37
55-59	4	23	5	5	1	1	3	3	1	5	2	43
60-64	3	17	9	2	3	3	3	5	6	20	5	38
65-69	3	12	7	7	2	2	3	3	3	12	7	42
70-74	3	5	6	1	1	1	1	1	1	5	6	22
75-	...	9	7	...	...	...	1	1	10	7	1	21
N/S	...	2	...	...	...	...	...	...	2	...	1	19
Total	55	140	60	11	4	36	47	12	13	1	91	379

## SOURCE OF REPORT

Source	No.	Source	No.
Mass Survey	127*	Other Hospital	33
Private Practitioner	44	Transfers in	19
Private Practitioner	33	Sanatorium	1
Repatriation Hospital	18	Chest Clinics	103
		Post Mortem	1
Total	...	...	379

\* Includes 11 cases discovered in 1957.

**Appendix IV**  
**Western Australia**  
**PULMONARY TUBERCULOSIS**

Year		Population in 1,000s	Notifications Received	Incidence Rate per 100,000 Population	Deaths Registered	Mortality Rate per 100,000 Population
1911	...	287	259	90·2	190	66·2
1912	...	301	429	142·5	220	73·1
1913	...	313	424	135·5	206	65·8
1914	...	323	353	109·3	229	70·9
1915	...	321	336	104·7	233	72·6
1916	...	313	511	163·5	225	71·9
1917	...	306	464	151·6	217	70·9
1918	...	308	432	140·5	245	79·5
1919	...	320	467	145·9	289	91·6
1920	...	330	442	133·9	259	78·4
1921	...	334	424	126·9	277	82·9
1922	...	341	387	113·8	256	75·1
1923	...	351	361	102·8	216	61·5
1924	...	363	381	104·6	228	62·8
1925	...	373	403	108·4	259	69·4
1926	...	381	415	108·2	252	66·1
1927	...	392	409	104·3	231	56·4
1928	...	408	395	96·8	282	69·1
1929	...	421	400	95·0	245	53·4
1930	...	429	569	132·6	218	50·8
1931	...	432	372	86·1	223	51·6
1932	...	435	339	77·9	203	46·7
1933	...	439	295	67·2	207	47·2
1934	...	442	287	64·9	218	49·3
1935	...	447	270	60·4	210	47·0
1936	...	452	338	74·8	193	42·7
1937	...	457	239	53·0	172	37·6
1938	...	464	247	53·2	177	38·1
1939	...	470	202	43·0	179	38·1
1940	...	473	231	48·8	181	38·3
1941	...	474	154	32·5	185	39·0
1942	...	477	113	23·7	175	36·7
1943	...	477	273	57·3	144	30·2
1944	...	481	219	45·4	134	27·9
1945	...	488	271	55·5	149	30·5
1946	...	493	343	69·6	163	33·1
1947	...	502	372	74·0	128	25·4
1948	...	515	325	63·1	157	30·5
1949	...	533	499	93·6	123	23·1
1950	...	558	586	104·8	129	23·1

DEATH CLASSIFICATIONS ACCORDING TO 6TH (1948) INTERNATIONAL LIST

1950	...	558	586	104·8	125	22·4
1951	...	580	467	80·4	76	13·1
1952	...	601	508	84·4	75	12·5
1953	...	621	378	60·6	43	6·9
1954	...	640	348	54·3	57	8·9
1955	...	659	413	62·7	31	4·7
1956	...	677	424	62·6	43	6·3
1957	...	692	332	47·9	36	5·2
1958	...	706	355	50·3	22	3·1

## Appendix V

### REPORT OF THE TUBERCULOSIS PHYSICIAN

To the Director,  
Tuberculosis Control Branch.

Sir, I have the honour to submit a report for the year ended 31st December, 1958.

#### PERTH CHEST CLINIC

##### *Out-Patient Clinics*

###### Medical :

These are held on Monday, Wednesday and Friday mornings each week.

Total attendances ....	....	....	....	....	....	....	....	....	....	....	....	3,188
Average attendance per clinic	....	....	....	....	....	....	....	....	....	....	....	22

###### Surgical :

These are held on Thursday afternoons.

Total clinics ....	....	....	....	....	....	....	....	....	....	....	....	39
Total patients ....	....	....	....	....	....	....	....	....	....	....	....	128
Average per Surgical clinic	....	....	....	....	....	....	....	....	....	....	....	3

#### *Mass Radiography*

##### *Perth Chest Clinic (Static Unit)*

Number of 35 mm. exposures ....

....

29,843

Groups X-rayed include the following :

Private patients (routine) ....	....	....	....	....	....	....	....	....	....	....	....	1,062
Armed Services ....	....	....	....	....	....	....	....	....	....	....	....	2,342
Commonwealth and State Public Service Entrants ....	....	....	....	....	....	....	....	....	....	....	....	2,026
Contacts ....	....	....	....	....	....	....	....	....	....	....	....	752
Immigrants ....	....	....	....	....	....	....	....	....	....	....	....	1,298
Volunteers ....	....	....	....	....	....	....	....	....	....	....	....	10,433
*Attendances in lieu Metropolitan Survey ....	....	....	....	....	....	....	....	....	....	....	....	10,046
Miscellaneous Groups ....	....	....	....	....	....	....	....	....	....	....	....	1,188
National Service Trainees ....	....	....	....	....	....	....	....	....	....	....	....	696

Total number of retakes on full-size film was 364, representing 1·2 per cent. of the 35 mm. films taken by the Static Unit.

##### *Mobile X-ray Units (Metropolitan and Country)*

Number of 35 mm. exposures ....

....

119,775

Groups X-rayed include the following :

Armed Services and National Service Trainees ....	....	....	....	....	....	....	....	....	....	....	....	1,399
---	------	------	------	------	------	------	------	------	------	------	------	-------

\* These are people who attended Perth Chest Clinic for X-ray during the Metropolitan Survey instead of the Mobile Unit operating in their home suburb.

University of W.A. ....	....	....	....	....	....	....	....	....	....	....	....	1,943
"Sunset" Home ....	....	....	....	....	....	....	....	....	....	....	....	477
Mt. Henry Home ....	....	....	....	....	....	....	....	....	....	....	....	480
Fremantle Prison ....	....	....	....	....	....	....	....	....	....	....	....	435
Claremont Mental Hospital ....	....	....	....	....	....	....	....	....	....	....	....	1,475
Lemnos Hospital ....	....	....	....	....	....	....	....	....	....	....	....	125
Heathcote ....	....	....	....	....	....	....	....	....	....	....	....	151
Greenplace Hospital ....	....	....	....	....	....	....	....	....	....	....	....	24
Whitby Falls ....	....	....	....	....	....	....	....	....	....	....	....	74
M.V. "Port Victor" ....	....	....	....	....	....	....	....	....	....	....	....	77
Braille Home Victoria Park ....	....	....	....	....	....	....	....	....	....	....	....	75
Perth Road Board Survey ....	....	....	....	....	....	....	....	....	....	....	....	7,733
Mosman Park Survey ....	....	....	....	....	....	....	....	....	....	....	....	3,073
Cottesloe Survey ....	....	....	....	....	....	....	....	....	....	....	....	7,113
North Fremantle Survey ....	....	....	....	....	....	....	....	....	....	....	....	1,267
East Fremantle Survey ....	....	....	....	....	....	....	....	....	....	....	....	2,707
Peppermint Grove Survey ....	....	....	....	....	....	....	....	....	....	....	....	615
Claremont Survey ....	....	....	....	....	....	....	....	....	....	....	....	3,754
Nedlands Survey ....	....	....	....	....	....	....	....	....	....	....	....	9,606
Subiaco Survey ....	....	....	....	....	....	....	....	....	....	....	....	7,093
City of Perth Survey ....	....	....	....	....	....	....	....	....	....	....	....	34,222

Bunbury Survey	....	....	....	....	....	....	....	7,122
Busselton Survey	....	....	....	....	....	....	....	3,286
Albany Survey	....	....	....	....	....	....	....	6,688
Woodanilling Survey	....	....	....	....	....	....	....	345
Denmark Survey	....	....	....	....	....	....	....	941
Manjimup Survey	....	....	....	....	....	....	....	6,347
North-West Survey	....	....	....	....	....	....	....	3,283
Waroona Survey	....	....	....	....	....	....	....	1,072
Yarloop Survey	....	....	....	....	....	....	....	547
Harvey Survey	....	....	....	....	....	....	....	1,781
Brunswick Junction Survey	....	....	....	....	....	....	....	958
Geraldton Survey	....	....	....	....	....	....	....	6,475
Wyalkatchem Survey	....	....	....	....	....	....	....	152

*Mass Radiography Results\**

Total of persons X-rayed on 35 mm. film	....	....	....	....	....	....	....	163,089
†Total of persons X-rayed on large films (including 620 normals)	....	....	....	....	....	....	....	1,458
Cases of pulmonary tuberculosis	....	....	....	....	....	....	....	111
Admitted to hospital	....	....	....	....	....	....	....	104
Under out-patient observation	....	....	....	....	....	....	....	7
Suspect cases under out-patient observation	....	....	....	....	....	....	....	103
Incident of tuberculosis (notified cases)	....	....	....	....	....	....	....	.07%
Non-tuberculous abnormalities diagnosed (including 41 cases of pulmonary carcinoma)	....	....	....	....	....	....	....	624

**PERSONS REFERRED TO PERTH CHEST CLINIC FOR X-RAY**

*Cases referred for X-ray by Private Practitioners*

Number of patients referred (including 1,062 35 mm. films and 2,368 full-size films)	....	....	....	....	....	....	....	3,430
Cases of pulmonary tuberculosis notified	....	....	....	....	....	....	....	16
Admitted to hospital	....	....	....	....	....	....	....	15
Under out-patient observation	....	....	....	....	....	....	....	1
Suspect cases under out-patient observation	....	....	....	....	....	....	....	12
Incidence of tuberculosis (notified cases)	....	....	....	....	....	....	....	.47%
Non-tuberculous abnormalities diagnosed (including 17 cases of pulmonary carcinoma)	....	....	....	....	....	....	....	582

*Applicants for Entry to the Mining Industry*

Total number of applicants	....	....	....	....	....	....	....	484
Cases of pulmonary tuberculosis notified	....	....	....	....	....	....	....	2
Admitted to hospital	....	....	....	....	....	....	....	2
Under out-patient observation	....	....	....	....	....	....	....	...
Suspect cases under out-patient observation	....	....	....	....	....	....	....	2
Non-tuberculous conditions diagnosed	....	....	....	....	....	....	....	49

*Applicants for Employment on Hospital Staff*

Total number of applicants	....	....	....	....	....	....	....	494
Cases of pulmonary tuberculosis notified and admitted to hospital	....	....	....	....	....	....	....	1
Suspect cases under out-patient observation	....	....	....	....	....	....	....	...
Non-tuberculous conditions diagnosed	....	....	....	....	....	....	....	9

*Royal Perth Hospital (Routine X-ray of New Patients)*

Patients followed up by this clinic	....	....	....	....	....	....	....	9
Cases of pulmonary tuberculosis notified	....	....	....	....	....	....	....	3
Admitted to hospital	....	....	....	....	....	....	....	2
Under out-patient observation	....	....	....	....	....	....	....	1
Suspect cases under out-patient observation	....	....	....	....	....	....	....	1
Non-tuberculous conditions diagnosed	....	....	....	....	....	....	....	4

*Immigrants*

Patients followed up by this clinic	....	....	....	....	....	....	....	22
Cases of pulmonary tuberculosis notified	....	....	....	....	....	....	....	3
Admitted to hospital	....	....	....	....	....	....	....	2
Under out-patient observation	....	....	....	....	....	....	....	1
Suspect cases under out-patient observation	....	....	....	....	....	....	....	3
Non-tuberculous conditions diagnosed	....	....	....	....	....	....	....	8

*Miscellaneous*

Patients followed up by this clinic ....	....	....	....	....	....	....	16
Cases of pulmonary tuberculosis notified ....	....	....	....	....	....	....	6
Admitted to hospital ....	....	....	....	....	....	....	1
Under out-patient observation ....	....	....	....	....	....	....	5
Suspect cases under out-patient observation ....	....	....	....	....	....	....	....
Non-tuberculous conditions diagnosed ....	....	....	....	....	....	....	4

**MANTOUX TESTS AND B.C.G. INOCULATION (PERTH METROPOLITAN AREA)**

*National Service Trainees*

Mantoux tests performed ....	....	....	....	....	....	....	848
Positive reactions ....	....	....	....	....	....	....	419
Negative reactions ....	....	....	....	....	....	....	415
B.C.G. inoculations ....	....	....	....	....	....	....	411

*Schools\**

Mantoux tests performed ....	....	....	....	....	....	....	268
Positive reactions ....	....	....	....	....	....	....	98
Negative reactions ....	....	....	....	....	....	....	170
B.C.G. inoculations ....	....	....	....	....	....	....	Nil

*Contacts*

Mantoux tests performed ....	....	....	....	....	....	....	965
Positive reactions ....	....	....	....	....	....	....	255
Negative reactions ....	....	....	....	....	....	....	697
B.C.G. inoculations ....	....	....	....	....	....	....	306

*Miscellaneous (Hospital Staffs, etc.)*

Mantoux tests performed ....	....	....	....	....	....	....	682
Positive reactions ....	....	....	....	....	....	....	376
Negative reactions ....	....	....	....	....	....	....	281
B.C.G. inoculations ....	....	....	....	....	....	....	227
Total Mantoux tests ....	....	....	....	....	....	....	2,763
Total B.C.G. inoculations ....	....	....	....	....	....	....	944

**VISITING NURSES**

*Figures for the year ending 31st December, 1958*

Number of patients in Metropolitan area on visiting list ....	....	....	....	....	....	....	1,796
Number of home visits ....	....	....	....	....	....	....	4,290
Number of patients with +ve sputum ....	....	....	....	....	....	....	8

\* Special Contact Survey.

*Full-size Chest X-rays at Perth Chest Clinic—X-ray Findings*

Source of Reference	Normal	T.B. Admitted	T.B. Out- Patients	T.B. Suspects	Pul- monary Cancer	Other Con- ditions	Total
Private Practitioners ....	1,758	15	1	12	17	565	2,368
Mass Survey ....	620	45	3	63	30	248	1,009
Hospital Staff Applicants ....	484	1	....	....	....	9	494
Mining Industry Applicants ....	431	2	....	2	....	49	484
Immigrants ....	8	2	1	3	....	8	22
Royal Perth Hospital ....	1	2	1	1	....	4	9
Transfers of Notified Cases from Interstate ....	....	....	5	....	....	1	6
King Edward Memorial Hospital ....	1	....	....	....	....	1	2
Other Hospitals ....	1	....	....	....	....	1	2
Miscellaneous ....	4	1	....	....	....	1	6
Grand Total ....	....	....	....	....	....	....	4,402

**FREMANTLE CHEST CLINIC**

*Out-Patient Clinics*

Total attendances ....	....	....	....	....	....	....	529
Average attendance per clinic ....	....	....	....	....	....	....	10
Chest X-rays taken on full-size film ....	....	....	....	....	....	....	2,036

*Mantoux Testing and B.C.G. Inoculation*

Mantoux tests performed	....	....	....	....	....	....	....	....	592
Positive reactions	....	....	....	....	....	....	....	316	
Negative reactions	....	....	....	....	....	....	....	272	
B.C.G. inoculations given	....	....	....	....	....	....	....	....	97

*Cases referred by Private Practitioners*

Patients referred	....	....	....	....	....	....	....	....	320
Cases of pulmonary tuberculosis notified and admitted to hospital	....	....	....	....	....	....	....	....	6
Incidence of tuberculosis (notified cases)	....	....	....	....	....	....	....	....	1·9%
Non-tuberculous abnormalities diagnosed	....	....	....	....	....	....	....	....	153

*Mass Radiography*

Total 35 mm. exposures	....	....	....	....	....	....	....	....	17,807
Groups X-rayed were as follows :									
Volunteers	....	....	....	....	....	....	....	....	3,823
Armed Services	....	....	....	....	....	....	....	....	170
Merchant Navy	....	....	....	....	....	....	....	....	191
Commonwealth and State Public Service Candidates	....	....	....	....	....	....	....	....	63
King Edward Memorial Hospital patients	....	....	....	....	....	....	....	....	38
Contacts	....	....	....	....	....	....	....	....	70
Migrants	....	....	....	....	....	....	....	....	256
Miscellaneous	....	....	....	....	....	....	....	....	176
*Mass Survey	....	....	....	....	....	....	....	....	13,020

*Mass Radiography Findings*

Cases of pulmonary tuberculosis notified	....	....	....	....	....	....	....	....	20
Admitted to hospital	....	....	....	....	....	....	....	....	15
Under out-patient observation	....	....	....	....	....	....	....	....	5
Suspect cases under out-patient observation	....	....	....	....	....	....	....	....	53
Incidence of tuberculosis (notified cases)	....	....	....	....	....	....	....	....	·11%
Non-tuberculous abnormalities	....	....	....	....	....	....	....	....	110

F. E. HEYMANSON, M.B., B.S.,

Tuberculosis Physician,

Tuberculosis Control Branch.

\* Also included in MASS RADIOGRAPHY figures.

## Appendix VI

### ANNUAL REPORT - WOOROLOO SANATORIUM

The Director,  
Tuberculosis Control Branch,  
Chest Clinic,  
17 Murray Street,  
PERTH.

I have the honour to present a report on the activities of the State Sanatorium, Wooroloo, for the year ending 31st December, 1958.

My term of office as Medical Superintendent at this institution ceased on 31st July, when I was transferred to Perth Chest Hospital, and the compilation of this report therefore has been dependent on reference to the headsheets of many patients whom I did not actually see in person. I have had every assistance, however, from Dr. Chappell and the clerical staff of the Sanatorium, for which I am grateful.

#### TREATMENT

Routine treatment with Streptomycin and Isoniazid was continued as in other years. As a general rule 1 gram of Streptomycin and 300 to 400 mgm. of Isoniazid were given daily to all patients under the age of 50 years. Those patients over 50 were treated with Dimycin, a mixture of Dihydrostreptomycin and Streptomycin sulphate, in the hope of reducing vestibular damage. This drug was not used in patients under 50 because of the recognised danger of permanent cochlear nerve damage related to dihydrostreptomycin. After three to six months, the Streptomycin was reduced to 1 gram three times weekly, and P.A.S. 12 grams daily were added to the regime, and on the patient's discharge the continuation of P.A.S. and Isoniazid was advised for a further period of 12 to 18 months, in all a total of two years continuous treatment being advocated. The results of this regime were once again most gratifying, as can be seen in the conversion rate of new admissions not previously treated by any form of chemotherapy. In the period from 1st October, 1957, to 30th September, 1958, there were 122 new admissions with a positive sputum and in 106 of these (88·33 per cent.) complete conversion of sputum occurred within three months, and in a further 12 (10 per cent.) conversion occurred within six months. Two only (1·67 per cent.) failed to convert their sputum at the end of six months treatment, and two others died within three months of admission.

An important pre-requisite to successful chemotherapy however is organism sensitivity, as indicated by a vastly reduced conversion of patients previously treated with drugs resulting in the emergence of Streptomycin and Isoniazid resistance. Of 27 cases admitted or readmitted, who had previously been treated with various combinations of Streptomycin, P.A.S. and Isoniazid, eight (29 percent.) failed to convert within six months, the obvious inference being that as a result of inadequate courses of chemotherapy in the past their organisms were no longer sensitive to the drugs.

A further indication of the effectiveness of longterm chemotherapy which has now been in progress in this State for the past five years is the relapse rate as seen over the past two to three years. There were 23 readmissions to the Sanatorium with active tuberculosis during the year, but of these, excluding recent absconders, on the present basis of therapeutic standards only two were regarded as having had adequate chemotherapy in the past. One of these had had an infected extrapleural space associated with plombage, and the other was a severe case of ankylosing spondylitis requiring Butazolidin for the control of his pain, who also had a history of peptic ulceration, who had difficulty in toleration P.A.S. following his discharge from the Sanatorium.

#### Surgery.

Until the opening of Perth Chest Hospital on 1st September, 1958, major surgical treatment was performed at Royal Perth Hospital by Mr. F. J. Clark and Mr. J. A. Simpson, and to these surgeons, together with their anaesthetists Dr. G. R. Troup and Dr. D. R. C. Wilson we again express appreciation for the high standard of treatment maintained.

A marked reduction in surgical intervention was noted, principally due to the increasing body of evidence in support of the efficacy of chemotherapy alone in sterilising tuberculous lesions in the chest, even when residual caseous masses are still apparent on radiological examination.

The surgical procedure most commonly used was again segmental resection and it is of interest to note that no cases were subject to modified thoracoplasty with plombage. A summary of surgical procedure carried out on Sanatorium patients up to the end of July is appended hereunder :—

Segmental resections	....	....	....	7
Lobectomies	....	....	....	3
Thoracoplasty	....	....	....	1
Removal of infected plomb, drainage of extrapleural space and subsequent thoracoplasty	....	....	....	2
Pleuro pneumonectomy	....	....	....	1

In view of the evidence recently adduced, it appears that the treatment of tuberculosis now consists of longterm chemotherapy, with resection of those areas of disease in which after six to nine months adequate drug treatment, the disease remains uncontrolled, as indicated by persistent cavitation, or a per-

sistent positive sputum, or both. Occasional cases in whom these conditions exist, and who are unsuitable for resection for various reasons, require permanent collapse measures, usually by means of a standard thoracoplasty.

#### *Consultant Services.*

Mr. H. H. Hill, orthopaedic surgeon, Dr. Adrian Lamb, ophthalmologist, Dr. T. Anthony, Dermatologist, and Dr. W. B. C. Gray, Psychiatrist, continued to assist in the solution of problems related to their various specialities. Four cases were transferred to Royal Perth Hospital for surgical treatment of extra-pulmonary tuberculosis, and we are grateful to the consultant staff for their continued interest and assistance.

#### *Dental Services.*

Mr. Kevin Wren continued to provide dental attention for all patients of the Sanatorium, visiting two days a week until the opening of the Perth Chest Hospital after which, with the transfer of many patients to that institution, he spends one day per week at the Sanatorium and devoted the other available day to the care of the patients at the Perth Chest Hospital.

#### *Laboratory Investigations.*

In addition to routine bacteriological investigations on suspected tuberculosis material, further tests were carried out on the comparative values of various methods of concentration, and a survey of blanket sterilisation by laundry methods was the subject of extensive bacteriological investigation. Mr. E. Doilov, the senior technician, continued to maintain a highly commendable standard of efficiency. A brief report on his activities during the year, together with an interesting survey of the activities of the laboratory over the last 15 years, has already been submitted.

#### *X-Ray Services.*

In addition to X-Rays of the chest, which together with tomograms and bronchograms, totalled over 3,000 in number, a variety of miscellaneous investigations were carried out, including investigations of the spine, teeth, sinuses and skull, and intravenous pyelograms and cholectystograms, and again an efficient standard of radiograph was maintained throughout the year.

#### *Rehabilitation.*

The impact of early diagnosis and successful treatment by longterm chemotherapy was again apparent in the field of rehabilitation. Whereas the management of tuberculosis patients prior to the days of adequate chemotherapy, included the necessity to arrange vocational training or placement in new, suitable, occupations for 80 per cent. of male patients undergoing treatment, the number requiring complete change of occupation now has been reduced to less than 10 per cent. Nevertheless with the assistance of the Commonwealth Social Services Department whose Education and Training officer, Mr. A. E. Perry, has continued to provide invaluable assistance, every patient has been considered as an individual problem with regard to rehabilitation, and steps have been taken to provide the necessary training for those requiring training for altered employment.

Linley Valley Colony continued to employ a small number of ex-patients, and the Federal Cardboard Box Factory conducted by the West Australian Branch of N.A.P.T.A., again provided part-time work for many patients whose return to fulltime work was thus made easier by "sheltered" work under ideal conditions.

#### *Social Service.*

Miss G. Paddon again assisted materially in the solution of a wide variety of social problems, the nature of which is indicated by a brief summary of her activities, as listed below :—

Number of interviews on Admission	.....	.....	.....	.....	.....	.....	.....	400
<b>Financial Assistance—</b>								
T.A. Application completed	.....	.....	.....	.....	.....	.....	.....	108
Miscellaneous—Insurance, Pensions, Sick Benefit, Workers' Compensation,								
Mine Workers' Relief	.....	.....	.....	.....	.....	.....	.....	29
Payments on behalf of Native Welfare	}		.....	.....	.....	.....	.....	390
Payments on behalf of Progress and Pastimes Club	}		.....	.....	.....	.....	.....	260
Department of Social Services (general enquiries)	.....	.....	.....	.....	.....	.....	.....	13
Domestic problems	.....	.....	.....	.....	.....	.....	.....	7
Child Placement	.....	.....	.....	.....	.....	.....	.....	2
Domestic help	.....	.....	.....	.....	.....	.....	.....	38
Welfare of Native Patients (enquiries and action)	.....	.....	.....	.....	.....	.....	.....	21
Travel Arrangements	.....	.....	.....	.....	.....	.....	.....	4
Accommodations	.....	.....	.....	.....	.....	.....	.....	16
Home Visits	.....	.....	.....	.....	.....	.....	.....	15
Visits to Royal Perth Hospital	.....	.....	.....	.....	.....	.....	.....	7
Visits to other Institutions	.....	.....	.....	.....	.....	.....	.....	144
Personal Services	.....	.....	.....	.....	.....	.....	.....	516
Miscellaneous Enquiries	.....	.....	.....	.....	.....	.....	.....	11
Department of Immigration (naturalization and general enquiries)	.....	.....	.....	.....	.....	.....	.....	11
Shipping Cases (enquiries and action)	.....	.....	.....	.....	.....	.....	.....	243
Elections—Federal (special assistance)	.....	.....	.....	.....	.....	.....	.....	104

### *Occupational and Art Therapy.*

These two forms of therapy again played an important part in the maintenance of patient morale throughout the year. Miss Elizabeth Adam was transferred to Perth Chest Hospital in August, and her place was subsequently taken by Miss Murray-Robertson.

We are again grateful to Mr. Guy Grey Smith for his enthusiasm in stimulating an interest in art, either in its cultural aspects or as diversional therapy.

### TRANSFER OF PATIENTS TO PERTH CHEST HOSPITAL

On 22nd August, 70 patients were transferred from the Sanatorium to the Chest Hospital to form the foundation patients of that institution. The transfer was effected smoothly and with absolute comfort to patients, and to those who were responsible at the Sanatorium for the organisation of the move, the highest credit is due. We are grateful to the Commanding Officer and members of the 7/13th Field Ambulance who provided ambulance transport, drivers and escorts for the patients, and played a major part in the excellence of the manoeuvre.

### *Vital Statistics.*

#### *Admissions—*

Male	...	...	...	...	...	...	...	...	142
Female	...	...	...	...	...	...	...	...	56
Total	...	...	...	...	...	...	...	...	198

#### *Method of Discovery—*

Mass Miniature Radiography—									
Metropolitan	...	...	...	...	...	...	...	...	51
Country	...	...	...	...	...	...	...	...	31
Total	...	...	...	...	...	...	...	...	82

#### Private practitioners via Perth and Fremantle Chest Clinics—

Metropolitan	...	...	...	...	...	...	...	...	11
Country	...	...	...	...	...	...	...	...	19
Total	...	...	...	...	...	...	...	...	30

Referred from Royal Perth Hospital	...	...	...	...	...	...	...	...	11
Other institutions	...	...	...	...	...	...	...	...	4
Perth Chest Clinic (follow-up of suspect migrants, contacts and pre-employment routine X-Rays	...	...	...	...	...	...	...	...	41
Fremantle Chest Clinic (follow-up, etc.)	...	...	...	...	...	...	...	...	12
Kalgoorlie Chest Clinic (follow-up, etc.)	...	...	...	...	...	...	...	...	16

Of the 198 admissions, 166 were regarded as suffering from pulmonary tuberculosis, and of these 114 were proved bacteriologically and the other 52 treated on clinical and radiological grounds. There were six cases of extrapulmonary tuberculosis, and 26 admissions were proved to be non-tuberculous. Details of these were as follows :—

Carcinoma of lung	...	...	...	...	...	...	...	...	4
Lung abscess	...	...	...	...	...	...	...	...	7
Lung cysts, with widespread emphysema	...	...	...	...	...	...	...	...	4
Sarcoidosis	...	...	...	...	...	...	...	...	2
Bronchiectasis	...	...	...	...	...	...	...	...	3
Miscellaneous, with X-Rays suggestive of tuberculous infiltration or effusion	...	...	...	...	...	...	...	...	6

#### *Readmissions.*

Forty-seven were readmitted to the Sanatorium including one direct from an Eastern States Sanatorium to which he had been transferred previously for compassionate reasons. Of the remaining 46, 23 were readmitted because of tuberculous disease and the remaining 23 for other reasons, including 14 for assessment of general condition and possible activity, one with carcinoma of the lung and six with non-specific acute pulmonary infections. Two patients were admitted to the Sanatorium for short periods from Linley Valley Colony. Of the 23 tuberculous readmissions, three were patients who had recently absconded and returned after periods of absence without leave. Of the remaining 20, one was a chronic

active case who returned for review after extended leave to suitable home conditions, and the apparent cause of the readmission of the remainder was as follows :—

Natural history of the disease—no previous chemotherapy ....	....	11
Natural history—inadequate chemotherapy on previous admissions		5
Natural history plus associated diseases ....	....	2
Infected extrapleural space associated with plombage ....	....	1

Excluding the three patients who returned after short periods of absence without leave, the average duration between previous discharge and readmission was  $6\frac{1}{2}$  years.

#### *Discharges.*

Two hundred and nineteen patients were discharged from hospital during the year, 88 were transferred to Perth Chest Hospital, and 18 were transferred to other institutions, making a total of 325 discharges.

Of this number 48 were discharged after short term treatment or assessment, and 169 had three months or longer in hospital. Of these 169 patients the average stay in the Sanatorium was 42 weeks.

Five patients absconded from the Sanatorium, all of whom had completely negative sputum results. Of all the patients discharged only one was positive on direct smear, and two were positive on culture. These three patients were discharged to approved home conditions.

#### *Deaths.*

There were 12 deaths only and of these two were regarded as directly related to tuberculosis. Two others died within three months of admission to the Sanatorium with active tuberculosis, but in each case the death was related to associated coronary disease and cardiac failure ; and the remaining eight patients died of completely unrelated causes. It would appear that even in a Sanatorium concerned with the treatment of all cases of tuberculosis, including old chronic positive cases, tuberculosis as a cause of death is rapidly becoming insignificant.

#### *Hansens Disease.*

There was one patient in the Leprosarium at the beginning of the year, and he remained alone throughout the year.

### CONCLUSION AND APPRECIATION

In concluding this, my final, report on the activities of the State Sanatorium, it is a pleasure to record my sincere appreciation of the efficient and conscientious service of the nursing staff as a whole over the years. To Matron E. S. Lochhead and her Assistant Matron E. Barker, I am most grateful for their loyal support and co-operation, which was reflected in the high standard of nursing characteristic of the Sanatorium at all times.

To the administrative staff, and to Mr. J. L. Cross in particular, I also express sincere appreciation for his ready co-operation and help at all times.

To my medical staff throughout the years that I have been associated with the Sanatorium, I would express deepest gratitude for their constant loyalty and friendship, and to you Sir and to the medical officers, visiting nurses and administrative staff of your department, I express sincere thanks for your help and appreciation of all our difficulties. To the Commissioner of Public Health, and the Under Secretary and Assistant Under Secretaries, together with the officers of the Department of Public Health, I would again express my appreciation for their ready help and co-operation.

Wooroloo, over the years in which I have been associated with it, has seen dramatic, indeed miraculous, changes in the outlook of the tuberculous patients, and the satisfaction of taking part in these changes has been matched in no small way by the pleasure of my association with all members of the staff working in the institution. Those of us who have transferred to Perth Chest Hospital look forward to the same happy associations as we have enjoyed at the State Sanatorium, and are grateful to those who remain behind for their support in the past and their good wishes for the future.

H. R. ELPHICK, M.B., B.S., M.R.A.C.P., M.R.C.P.,  
Physician Superintendent.

## Appendix VII

### REPORT OF THE PHYSICIAN SUPERINTENDENT, PERTH CHEST HOSPITAL

The Director,  
Tuberculosis Control Branch,  
Chest Clinic,  
17 Murray Street,  
Perth.

I have the honour to present a report on the first four months' activities of the Perth Chest Hospital. On the 22nd August the first four wards were opened and 68 patients admitted from Wooroloo Sanatorium. Reference has already been made to the excellence of the operation which was carried out by the 7/13th Field Ambulance in effecting the transfer of these patients to the hospital, and we are most grateful to the D.D.M.S. Western Command and the Commanding Officer of that unit for their co-operation and help in making transport available. The hospital was officially opened on the 1st September and subsequently new patients were admitted and a further 23 were transferred from Wooroloo. The fifth ward was opened on the 1st October and total admissions for the four months to the 31st December, including the 91 transfers from the Sanatorium, were 221.

The method of diagnosis of these patients, excluding Wooroloo transfers, was as follows :—

Mass Radiography :

Metropolitan	....	....	....	....	....	....	....	....	....	14
Country	....	....	....	....	....	....	....	....	....	14
										—

Total      ....      ....      ....      ....      ....      ....      ....      ....      ....      28

Perth Chest Clinic (outpatient follow-up, routine pre-employment X-rays, etc.)	34
Fremantle Chest Clinic	6
Kalgoorlie Chest Clinic	11
Referrals by Metropolitan Private Practitioners via Perth and Fremantle Chest Clinics	16
Referrals by country practitioners via Perth Chest Clinic	12
Referrals by private practitioners via Perth Radiological Clinic	4
Transfers from Royal Perth Hospital	10
Transfers from other institutions	9

Of the admissions 124 had active, sputum positive tuberculosis, and 29 had clinical and radiological evidence of active disease, but were not proved bacteriologically. There were 19 miners or ex-miners with silicosis and probable superimposed tuberculosis not bacteriologically proved ; 10 cases of extrapulmonary tuberculosis ; and 34 cases of non-tubercular disease. Of these, excluding 10 cases transferred from Wooroloo who have been detailed in the Wooroloo report, eight had non-specific pneumonia, including two with associated empyema ; there were six with carcinoma of the lung, two with non-tuberculous pleural effusion and eight suffering from miscellaneous chest conditions.

#### READMISSIONS

Of the total admissions 17 had been in tuberculosis institutions previously and may therefore be regarded as "readmissions" to a tuberculosis hospital. Of these, six were positive on concentration or culture, five were sputum negative, but treated as low grade active tuberculosis, and in the remaining six there was no evidence of active disease. Of the active cases, one was positive on discharge from Wooroloo eight months previously ; two had had drug resistant organisms demonstrated on their previous admission to hospital ; six had had inadequate courses of chemotherapy on previous admissions, and two had never had chemotherapy previously.

The average period intervening between their previous discharge and readmission was 48 months, but if the cases in whom readmission was anticipated because of positive sputum or resistant organisms (interval of 13 months only) the average duration of freedom from activity was 6½ years.

#### DISCHARGES

Seventy-six patients were discharged or transferred to other institutions, 45 of them after a short period of investigation and treatment, leaving 31 long term tuberculous patients, treated for three months or longer. Of these, the average stay in hospital, including the time spent at Wooroloo prior to admission to the Chest Hospital, was 37 weeks. The disease of all patients discharged was arrested or inactive and no sputum positive cases were discharged. There were no "irregular" discharges.

#### DEATHS

There was one death in a young woman with gross bilateral tuberculosis, despite what appeared to have been successful surgical treatment on one side.

## SURGICAL TREATMENT

Apart from minor procedures and an emergency thoracotomy in September, major surgery was deferred until 16th October, when the first resection for tuberculous disease was carried out. Details of surgical procedures subsequently are as follows :—

Lobectomy	....	....	....	....	....	....	....	....	....	....	3
Segmental resection	....	....	....	....	....	....	....	....	....	....	3
Thoracoplasty or modified thoracoplasty	....	....	....	....	....	....	....	....	....	....	5
Thoracotomy	....	....	....	....	....	....	....	....	....	....	3
Miscellaneous operations of non-tuberculous nature	....	....	....	....	....	....	....	....	....	....	16

Mr. F. J. Clark was responsible for the major portion of the surgery, and to him and Dr. G. R. Troup, his anaesthetist, we are sincerely grateful.

## CONSULTANT STAFF

Mr. F. J. Clark, Mr. J. A. Simpson and Mr. P. Gibson, consultant surgeons, attended regular weekly conferences at which all cases of surgical interest were considered, and we are grateful to them for their guidance and interest. To the other consultants, Mr. H. M. Hill, Orthopaedic Surgeon, Mr. Adrian Lamb, Ophthalmologist, Dr. T. C. Anthony, Dermatologist, and Dr. W. B. C. Gray, Psychiatrist, our thanks are also due for their assistance in the management of problems relating to their specialities.

## X-RAY DEPARTMENT

Details of the work done in this department are as follows :—

Chest X-rays, 17 x 14 or 15 x 12	....	....	....	....	....	....	....	....	....	....	671
Chest X-rays, 70 millimetre	....	....	....	....	....	....	....	....	....	....	80
Tomograms	....	....	....	....	....	....	....	....	....	....	44
Bronchograms	....	....	....	....	....	....	....	....	....	....	23
Other regions, including Pyelograms, Sinograms, and X-rays of bones and joints	....	....	....	....	....	....	....	....	....	....	86
Electrocardiograms	....	....	....	....	....	....	....	....	....	....	27

## LABORATORY

The tuberculosis section of the Public Health Laboratory was transferred from the Chest Clinic during the week-end following the admission of the first patients. The transfer was executed smoothly and efficiently, and immediate facilities for laboratory investigation for the incoming patients were provided.

## STAFF

All members of the staff in every section of the institution are deserving of the highest praise for their enthusiasm and co-operation in the initial phases of the hospital's activities. No attempt is made to single out any particular section as the efforts of all were equally meritorious. To Matron Anstey and her Assistant Matron and Senior Nursing Staff, however, I am particularly grateful for their untiring efforts in preparing the wards for the arrival of the first patients, and for their continued cheerfulness and understanding in the face of many minor deficiencies and difficulties in the early stages of our progress. We are fortunate in having a basic nursing staff of the highest quality, and already after four months operation, an excellent standard of nursing has been achieved, and we look forward to the future with complete confidence regarding the treatment and nursing care which may be expected by patients admitted to the hospital.

Perth Chest Hospital provides ideal working conditions, and we are grateful to you, Sir, for the part you played in its planning, for your enthusiasm and guidance in its initiation, and for your sustained interest in its welfare. We are grateful also to the Commissioner of Public Health and the officers of his department for the assistance they have given us since the opening of the hospital, and their continued interest in our problems.

H. R. ELPHICK,  
Physician Superintendent.

## Appendix VIII

### REPORT BY THE DIRECTOR OF EPIDEMIOLOGY

The outstanding experiences of 1958 were the continued suppression of poliomyelitis and the further reduction of diphtheria to the point where this disease too, has ceased to be a public health problem. The epidemiological highlight of the year under review was the outbreak of typhoid fever associated with bathing at City Beach. An outbreak of a disease resembling mild hepatitis without jaundice occurred at Norseman, and towards the end of the year a widespread epidemic of a rubella-like disease came under notice. A survey was undertaken in the dairying district of the South-West with the object of detecting evidence of past infection with leptospira pomona, and the findings are of special interest.

Laboratory assistance was of cardinal value in the investigation and control of various infections, but particularly in connection with the typhoid outbreak ; while plans went forward under the guidance of Professor Stanley for the establishment of an adequate Virus Laboratory.

The Poliomyelitis Immunisation Unit maintained its matchless reputation and administered its millionth dose of Salk vaccine during the year.

The following topics warrant extended comment :—

1. Poliomyelitis immunisation.
2. Typhoid and City Beach.
3. Leptospirosis.

#### 1. POLIOMYELITIS IMMUNISATION

The Poliomyelitis Immunisation Project commenced the year 1958 with completion of the Child Vaccination Programme in sight, and it achieved this objective by May. By that time many more children had been immunised than had been enumerated at the 1954 Census, and it was therefore impossible to compute "the proportion immunised."

On 19th May the full-scale Adult Vaccination Programme was embarked upon, using the same zonal pattern of organisation as had been used so successfully with the Child Campaign. But the mobile units, instead of setting up clinics at schools, in many cases used other sites recommended by the Local Health Authorities. Every effort was made to make it as easy as possible for adults to attend. Industrial and commercial establishments were approached and arrangements made to send an immunisation team to any place where 50 or more people required immunisation. Special "lunch-hour" and "after-work" clinics were organised ; and suburban clinics were often set up at shopping centres and service stations to suit the convenience of the local people.

Only two cases of poliomyelitis were notified during the year, but only one of these was confirmed by the Federal Poliomyelitis Surveillance Committee ; the patient being an unvaccinated adult. Since the inception of Salk Vaccination in July, 1956, and up to the end of 1958, therefore, only six cases of poliomyelitis had been registered and not one of these had been vaccinated. This dramatic eclipse of a disease which was so recently one of the community's most dreaded epidemic problems, can now be attributed with some confidence to mass Salk Vaccination.

As was pointed out in the previous Annual Report, Salk Vaccination has had an impact far beyond the area of poliomyelitis itself, for it has made parents more "immunisation-conscious" than ever before ; and immunisation against other childhood diseases has received a sharp stimulus. This has been reflected in markedly increased anti-diphtheria immunisations, and as the commonest antigen used is the "Triple Antigen," immunity against diphtheria, pertussis and tetanus is heightening fast. For these reasons it is difficult to over-emphasize the beneficial effects of the Salk Vaccination Programme, which must rank high among the Department's more notable accomplishments.

**POLIO INCIDENCE, W.A.—Before and After Salk Vaccination**

Year		Paralytic	Other	Total	Deaths
1948	...	Type of disease not specified, but all or nearly all probably paralytic		311	24
1949	...			61	6
1950	...			59	5
1951	...			94	4
1952	...			37	2
1953	...	39	5	44	3
1954	...	198	238	436	4
1955	...	22	11	33	2
1/1/56 to 30/6/56	...	171	228	399	14

1/7/56 : MASS SALK VACCINATION BEGAN

1/7/56 to 31/12/56	...	1*	1*	2*	Nil
1957	...	3*	...	3*	Nil
1958	...	1*	...	1*	Nil

\* Not vaccinated.

SALK VACCINATION (1/7/56—31/12/56)

Age Group	3 Injections	2 Injections	1 Injections	1, 2 or 3 Injections
Under 15	9	97,651	6,730	104,390
Over 15	2	10,761	890	11,653
All Ages	11	108,412	7,620	116,043

Total number of separate injections given .... .... .... 224,477

1/7/56 to 31/12/57

Age Group	3 Injections	2 Injections	1 Injections	1, 2 or 3 Injections
Under 15	127,853	67,647	3,635	199,135
Over 15	15,937	32,439	4,455	52,831
All Ages	143,790	100,086	8,090	251,966

Progressive total number of separate injections given .... .... .... 639,632

Number of individual injections given in 1957 .... .... .... 415,155

1/7/56 to 31/12/58

Age Group	3 Injections	2 Injections	1 Injections	1, 2 or 3 Injections
Under 15	176,565	34,073	40,068	250,706
Over 15	52,128	67,491	85,038	204,657
All Ages	228,693	101,564	125,106	455,363

Progressive total number of separate injections .... .... .... 1,014,313

Number of individual injections given in 1958 .... .... .... 374,681

## 2. TYPHOID AND CITY BEACH

Typhoid infections occur from time to time in almost every modern community. In the more advanced communities, however, incidence of the disease is low, and comprises a few apparently unconnected cases occurring at relatively wide intervals of time. Despite conscientious investigation designed to identify the origin of these individual infections, only in uncommon instances is the source identifiable. The majority defy detection, and are generally presumed to be due to food contamination by unrecognised carriers (who may have suffered from the disease several decades previously).

Typhoid in Western Australia during recent years has conformed to this general pattern. An average of nine cases has been customary each year. Most of these cases have been unrelated one to another and investigations by local health officers, assisted by the Department, have been largely unsuccessful. Only rarely has an associated carrier been identified and placed under permanent surveillance.

A rapid sequence of eight notifications during the early part of 1958 was therefore recognised as most unusual ; and a possibility that some common source of infection might exist was at once apparent. The routine enquiries conducted by local health authorities were therefore intensified and co-ordinated by the Department. The vehicles of infection incriminated in other outbreaks elsewhere received specific attention. These included contact with known cases or carriers, and food such as ice-cream, shellfish, desiccated coconut, prepared meats and salads. None of these appeared to be implicated ; but it was discovered that several of these early patients had bathed regularly at City Beach. This factor was re-investigated and it was found that not only had five of the first eight cases bathed at City Beach, but they had done so more frequently and for longer periods than the average beach visitor. Further, one of them (together with a companion) had on a recent occasion left the water because he had found it offensive.

The status of the sea-water at City Beach was immediately looked into, and a number of disturbing disclosures resulted.

1. The treatment of sewage at the main metropolitan plant in Subiaco was incomplete.
2. The outfall from this sewage plant lay approximately one mile south of the City Beach bathing area.
3. The weekly samples of City Beach sea-water had contained a very high concentration of fæcal organisms on at least two occasions during February.
4. An aerial photograph showed a zone of ocean discolouration originating at the outfall and involving the City Beach bathing area ; and swirls indicated that the outfall pipe (about 300 feet long) was broken in two places.



On 12th March the Minister for Works (who was also acting Minister for Health at the time) was apprised of these findings and advised to close the beach as a precautionary measure while further investigations proceeded. The Minister accepted this advice and immediately issued a warning to the public to refrain from bathing at City Beach until further notice. .

During the next three weeks, seven additional cases occurred. Five of these had been associated with City Beach prior to its closure ; while one of the remaining two was traced to a carrier. The outbreak then terminated and no further notifications were received for many weeks.

Thus, of the 15 cases which comprised the outbreak, 10 were associated with City Beach and one was due to a carrier. The origins of the four remaining were not identified.

The evidence incriminating City Beach was further strengthened when the results of 'phage typing of the strains of *salmonella typhi*, recovered from the patients concerned, became known. These had been sent to Melbourne for identification and it was found that the causative organisms involved were of five different types. A "mixed bag" such as this eliminated the possibility of the outbreak being due to "carrier-contamination" of some common foodstuff and strongly indicated a conglomerate source of infection such as sewage-polluted water.

#### Commentary

The pollution of bathing places is a constant source of anxiety to health authorities all over the world ; and it is customary for these to be kept under constant bacteriological surveillance. Nevertheless, convincing evidence to incriminate bathing in polluted "sea-water" as a cause for outbreaks of intestinal disease is extremely hard to find. This is not surprising. The "self-purifying" effects of sea-water are numerous. Dilution, aeration, salinity, sunlight, predatory bacteria and other factors combine to bring about the destruction of typhoid and other organisms which are discharged into the sea. For this reason it is virtually impossible to demonstrate the presence of pathogenic bacteria in small incidental samples of sea-water examined by standard techniques. On the other hand, it is known that the infective dose of *salmonella typhi* is minimal and minute, and that typhoid organisms are capable of surviving in sea-water for appreciable periods. It is also evident that the degree of pollution at a point some distance from a sewage outfall would vary according to prevailing winds and currents ; and that in the situation described, the overall hazard would be relatively small, intermittent, and brief. This indeed may have accounted for the limited number of bathers affected.

If the recreational value of City Beach is to be retained and an important amenity preserved without jeopardising the health of bathers, the Subiaco sewage treatment plant must command maximum attention from the engineering viewpoint. Meanwhile, the potential health hazard from this source warrants constant epidemiological alertness and regular bacteriological surveillance.

### 3. LEPROSPIROSIS

#### (A Serological Survey (*L. pomona*) in the Dairy Districts of South-Western Australia)

The existence, in South-Western Australia, of a bovine disease (icterohaemoglobinuria or "red-water" fever) believed to be due to leptospirosis, was reported some 16 years ago (Mahaffrey, Bennetts and Flood, 1942). Later it was shown that this disease was mainly due to *Leptospira pomona* (Peterson, 1951). The extent of human disease attributable to this organism in Western Australia, however, has never been established. This is not surprising, as published reports of the disease elsewhere indicate that the clinical manifestations are not distinctive and can closely simulate influenza (Johnson, 1950 ; Wellington, Stevenson and Ferris, 1951). Nevertheless, suspicious illnesses among south-west dairy farmers have been encountered by local practitioners from time to time. The individual laboratory investigation of these has been impracticable, but during the period April to June, 1958 an opportunity occurred to conduct a serological survey in the area involved.

This survey was carried out by officers of the Public Health Department in collaboration with the Veterinary Division of the Department of Agriculture. It involved visits to 63 farming properties located mainly in two regions—a coastal strip from Bunbury to Busselton, and an inland area in the vicinity of Manjimup. Specimens of blood were taken from 206 people and 398 animals ; and the sera were examined for agglutinins to *Leptospira pomona* at the Public Health Laboratory in Perth.

The human group comprised 131 farm personnel, 69 butchers and slaughtermen, and six veterinarians and health personnel. The animals included 368 cattle and 30 pigs. Agglutinations disclosed that approximately 13 per cent. of the human sera and 30 per cent. of the animal sera contained agglutinins to a titre of 1 in 100 or more. Details are as follows :—

Titre	Human Sera	Animal Sera
1 in 1,000	...	46
1 in 400	2	23
1 in 200	7	22
1 in 100	16	16
Nil or less than 1 in 100	179	291
	206	398

### HUMAN SERA

Titre	Farm Personnel	Butchers and Slaughtermen	Veterinarians and Health Personnel
1 in 1,000	2	...	...
1 in 400	2	...	...
1 in 200	7	1	...
1 in 100	13	4	...
Nil or less than 1 in 100	107	64	6
	131	69	6

### ANIMAL SERA

Titre	Cattle	Pigs
1 in 1,000	34	12
1 in 400	18	5
1 in 200	19	3
1 in 100	13	3
Nil or less than 1 in 100	284	7
	368	30

### ACKNOWLEDGMENTS

Dr. M. J. L. McGrath and Mr. Lee Brunning of the Public Health Department carried out the field work in collaboration with Mr. Peter Lewis from the Veterinary Division of the Department of Agriculture. Dr. H. W. Bennetts and Mr. C. R. Toop of the latter Department assisted with advice and in other ways. Dr. N. Kovacs and Mr. A. F. Drummond of the Public Health Laboratories were responsible for the serological titrations. Without the help and co-operation of all these officers the survey would not have been possible.

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### LEPTOSPIROSIS : A NOTE ON ITS HISTORY IN WESTERN AUSTRALIA

by

Dr. D. J. R. SNOW

The history of leptospirosis in Western Australia is obscure. References to the disease in the official records are scanty and infrequent. The only significant incident in the past appears to have been a series of about eight cases of a disease thought to be due to *Leptospira pomona*. Most of these patients were meat inspectors associated with a bacon factory near Fremantle during, and immediately after, the last war.

In order that data concerning this incident might not be lost, an attempt was made during 1958, to trace these patients. Only five were available for interrogation and from three of these, specimens of sera were obtained. The relevant clinical histories were as follows :—

*Case No. 1 : (C. F., Male, Aged 38 years, Meat Inspector).*

In 1944 this man was employed as a meat inspector at a bacon factory. His duties involved the handling of pig carcasses, and he had been so engaged for a period of about one year. During the course of his inspections he recalled having sustained a minor cut on the left thumb. This healed over in two or three days but the site remained tender, and was followed by a painful swelling in the left axilla. About a week after the initial injury he awoke one morning with an intense headache, and although he went to work he found he was unable to carry on and returned home to bed. He experienced no pain on movement of the eyes ; there was no stiffness of the neck, nor any joint and muscle pains. He remained febrile for nearly three weeks and vividly recalls a series of nightmares. He would awake suddenly in a drenching sweat with recollections of unpleasant dreams, and friends and relatives who visited him in hospital gained the impression that his mind had become disturbed. Defervescence was followed by intense weakness and prolonged debility. Convalescence occupied a period of some three months. He then returned to work, but a few days afterwards he complained of misty vision, pain on movement of the eyes, and an inability to withstand bright light. A few days later, his colleagues remarked that his eyes "looked like strawberries" and he consulted an ophthalmologist. The condition was identified as an iritis which subsided after a week's treatment but recurred a few months later. The condition subsided once more and there have been no further recurrences, but the eyes still remained somewhat sensitive to glare. In September 1958 (14 years later) this man's agglutination titre to *L. pomona* was 1 in 400.

*Case No. 2 : (W. H. Male, aged 26 years, Meat Inspector).*

In 1941 this patient was employed with the Commonwealth Department of Commerce and had been responsible for the inspection of pig carcasses at a bacon factory for several months.

According to his recollection, he took ill suddenly with malaise, lassitude, anorexia, headache, and tenderness at the back of the neck, with hypersensitivity of the skin in that region. Next day he shivered and sweated alternatively. The headache became violent, movement of the eyes was very distressing, and he experienced pains in the muscles and joints. He was treated at home, remained in bed for 10 days, and resumed work a few days later. About a fortnight after resuming work he recalls emerging into the sunlight one afternoon and experiencing "severe stabbing pains behind the eyes." He was unable to obtain relief except by fixing his eyes on one spot on the floor, and his colleagues noticed that his eyes were "blood-shot." On examination by an ophthalmologist, he was found to be suffering from iritis, from which he took several weeks to recover. Since, then, one eye has been unduly sensitive to sunlight. In 1958 (17 years afterwards) this patient's titre of *L. pomona* agglutinins was 1 in 100.

*Case No. 3 : (T. S. Male, aged 39 years, Meat Inspector).*

This man had been employed in handling carasses of cattle, sheep and pigs alternatively at an abattoir over a period of several years. One day in November, 1955, while at work, he developed a severe headache associated with a burning sensation of the scalp and generalised aches and pains. He had no backache, no joint pains, no shivering or sweating, and no pain behind the eyes. He went home to bed and remained away from work for about a week, but convalescence was protracted and it was several months before he felt himself again. In May, 1956 (six months after this episode) some blood was taken from him and sent to Brisbane where *L. Pomona* agglutinins were detected in a titre of 1 in 10,000. In August 1958 (two years afterwards) a titre of 1 in 100 persisted.

*Case, No. 4 : (J. M. Male, aged 46 years, Meat Inspector).*

In 1946 this man had been employed in examining pig carcasses at a bacon factory in Perth and had been so employed for a continuous period of 12 months. Some 600 pigs were being slaughtered each day at the establishment and they originated from the south-west portion of the State. No disease had been reported among the animals and there was no overt sign of disease in the carcasses.

On March 9, he took ill with lassitude, malaise, frontal headache and severe pains in most of his joints. These joint pains were most marked in the fingers. There was no backache, and no significant urinary or bowel symptoms. He had a remittent fever for five or six days followed by a small intermittent rise during the next week, whereafter his temperature remained normal. About a fortnight after onset of his illness, he complained of blurred vision and pain behind the eyes. Examination revealed conjunctival injection associated with signs of iritis. This eventually cleared up, but he did not regain his normal health for several weeks.

*Case No. 5 : (H. M. Male, Aged 40 years, Meat Inspector).*

In 1946 this man was engaged for some months in handling pig carcasses at a bacon factory in Perth. On returning to work from his Easter holidays he developed a sudden headache one afternoon, together with vague aches and pains in the limbs, which he ascribed to influenza. He went home to bed and was eventually admitted to hospital, where he was treated for three weeks. His most outstanding symptoms were severe pains behind the eyes and an extreme distaste for cigarettes. He made a gradual recovery without complications, but convalescence was protracted and it was three months before he regained full health.

#### ACKNOWLEDGMENT

Dr. Gerald Moss was kind enough to provide clinical notes relating to one of these patients, who was treated by him.



● ● TOWNS  
▲ FARMS

## Appendix IX

### REPORT BY DR. F. DEBNAY OF THE VENERAL DISEASE SECTION

The total of notified cases at the Clinic during the year was the lowest since the 1944 "peak" and showed a decrease of 30 per cent. on last year.

No fresh early cases of syphilis were seen during the year, though one or two recently treated cases arrived from other States.

Gratifying as the present figures may be, a warning should be sounded with regard to gonorrhoea. Reports from other countries including Britain and the U.S.A. show that certain strains of the gonococcus are developing increasing resistance to penicillin. Evidence seems to indicate that, once again, acute gonorrhoea cannot be regarded as a disease with a certain cure.

Though the present system of treatment has been employed in this Clinic for the past five years without evidence of waning efficiency, careful and more prolonged follow-up periods will have to be adopted if the chronic carrier state is to be prevented.

## Appendix X

### VENEREAL DISEASE IN WESTERN AUSTRALIA

Disease	Male		Female		Total	
	1957	1958	1957	1958	1957	1958
Syphilis—						
Primary     ....     ....	4	2	....	....	4	2
Secondary     ....     ....	2	....	4	....	6	....
Tertiary     ....     ....	1	2	2	1	3	3
Congenital     ....     ....	1	....	....	....	1	....
Total Syphilis     ....	8	4	6	1	14	5
Gonorrhoea     ....     ....	183	124	30	24	213	148
Granuloma*     ....     ....	1	....	4	....	5	....
Chancroid     ....     ....	....	1	....	....	....	1
Total     ....     ....	192	129	40	25	232	154

\* Native.

## Appendix XI

### LEPROSY REPORT, BY W. S. DAVIDSON

Chemotherapy in leprosy is a post-war introduction. Its advent has revolutionised not only the treatment of the disease but also our attitude towards its management and prevention. It is therefore appropriate to review the last 12 years of work in this field in Western Australia.

Leprosy was introduced to Western Australia about the turn of the century, as previously outlined by Snow in the 1949 Report. It is therefore a comparatively new disease among the non-immune population of Australian aborigines. As such, it displays characteristics not discernible in populations long accustomed to the disease and, in consequence, we see here what is probably a truer picture of leprosy than that described in countries where it has been long endemic, and where often the characteristics of the disease are concealed to some extent by the characteristic reactions of a semi-immune population.

If we define lepromatous leprosy as that in which acid fast bacilli are seen, the lepromin reaction is negative and the predominant histopathological picture is one of vacuolated histocytes and lepra cells, and the tuberculoid form as that in which acid fast bacilli are not seen by ordinary methods, the lepromin reaction is positive and the biopsy picture is one of round cell infiltration with tubercles and giant cells, then we have in W.A. at least three lepromatous cases for every one tuberculoid. This is in reverse proportion to what is typical in India and Africa. Furthermore, a neural destruction is not confined to the tuberculoid case and a rarity in the lepromatous. Neural involvement is almost invariably present in the lepromatous and proceeds pari passu with the disease to a degree of tissue destruction rarely seen in out tuberculoid cases.

Cases that have been regarded as tuberculoid have after a number of years broken down and become frankly lepromatous with demonstrable acid fast bacilli and negative lepromin reaction. Conversely, under treatment, lepromatous cases have become lepromin positive concurrently with a rapid improvement in their condition. Consequently, we do not regard these classifications as having any permanency or importance beyond an indication of the resistance being displayed to the infection at the time of examination.

Where only nerves are involved and no other demonstrable lesion we may refer to them as neural cases for descriptive purposes but regard them as tuberculoid in our classification subject to a positive lepromin reaction being elicited.

Such being the case, we can see no useful purpose in adopting a number of intermediary classifications as is the custom in other countries where racial immunities may give greater stability to the type and progress of the disease.

Table I gives an indication of the ages at which leprosy becomes apparent in our patients. There is no suggestion here that the disease is acquired in infancy or that the infant is more susceptible and we therefore consider that in countries where leprosy is acquired in childhood the indication is merely that the environment is such that the susceptible individual comes in contact with the disease at an early age, not that the early age makes him more susceptible to the disease.

Several cases of leprosy have developed in white individuals where contact with the disease has been of a very brief or cursory nature. The number of white persons that have developed the disease in Australia is remarkably high bearing in mind the few at risk and the opportunities for infection, and there are roughly two lepromatous cases to every one tuberculoid. It would therefore seem that any immunity the white man has is largely derived from his sanitary environment and not an intrinsic racial factor. Furthermore, although prolonged or repeated contact is conducive to infection, it is not essential for it.

From this picture of leprosy then, as we see it, we have come to regard susceptibles as persons who possess or are lacking in some intrinsic factor which makes them susceptible to the disease. This intrinsic factor, as suggested by the change in lepromin reaction, may not always be present in the same individual to the same degree. Infection or progress of the disease takes place according to the amount of intrinsic factor and infecting agent concurrently available to the host's tissues.

With such a hypothesis, infection may be acquired by brief contact but prolonged contact will greatly increase the chance of the two factors being available at the same time.

#### TREATMENT

Our experience with chemotherapy commenced towards the end of 1947 when, at the instigation of the late Dr. Herz, a few patients were put on Diasone or Promine.

Early in 1948, Sulphetrone by the oral route was given and in 1949 intramuscular Sulphetrone 50 per cent. solution, according to the method used by Cochrane, was introduced.

In 1950, Thiacetazone (Neustab) was added to the armamentaria of our leprosaria and Diaminodiphenyl-sulphone (D.D.S.) in 1951. In 1951 all patients were on some form of chemotherapy.

Isonicotinic acid hydrazide (Isoniazid) (I.N.H.) was added in 1952 and Promacetin given extensive trial in 1953.

Trial with Diphenylthiourea (Ciba 1906) was commenced in April, 1957, and Etilsul early in 1959.

The dramatic effect the impact of these drugs has had on the discharge rate and on the population of Derby Leprosarium can be seen in Table II.

The decrease in new admissions would tend to suggest that the crest of the epidemic has been passed.

The increasing number and proportion of readmissions is at first glance disappointing but it stands to reason if discharges are increased, the potential material for readmission is also increased. Furthermore, the bulk of readmissions has come either from those discharged before the introduction of chemotherapy or from those who had some treatment with chemotherapy in its earlier days. There is no doubt that the dramatic effect of these new treatments made us over-optimistic about the cure. Patients were discharged

after what would now be considered an inadequate period of chemotherapy. Originally patients were discharged when smear slides had been negative for 12 months, later, this was increased to 18 months, and now we discharge only after two years' negative slides and, if possible, treatment is continued outside the institution.

The majority of readmissions have come from the intramuscular sulphetrone group, but this does not necessarily indicate inferiority in this method of treatment. Because of the low toxicity associated with it and the rapid improvement of the patients, this was a very popular treatment in the earlier days and the majority of discharge cases that had the inadequate period of treatment referred to in the previous paragraph were treated by this method.

To increase the chances of cure in addition to prolonged treatment, it is now our custom to give each patient a course of a non-sulphone chemotherapeutic agent consecutively with sulphone therapy before considering him fit for discharge, thereby minimising the effect of drug resistance that may have developed in the infective organism.

Under the old regime of chaulmoogra and hydrocarpus oil the purely neural case received no treatment and was not admitted to the leprosarium unless in need of surgical assistance. With the apparent success of chemotherapy however, and with our increasing doubts regarding the non-infectivity of such cases, the matter was reviewed and since 1954 all neural cases have been admitted for treatment. This accounts for the large number of tuberculoid cases admitted in that year. An exception to this rule is made in elderly persons where no progression or activity is apparent in the neural damage. They are considered to consist largely of "burnt out" cases. Early surgery is carried out to decompress and transplant swollen nerves with active lesions and, late in 1954, trial was made with intro-articular hydrocortisone injected intra-neurally. A few favourable results were obtained from this treatment, but most were equivocal mostly due to the fact that it is well nigh impossible to elicit accurate information of a subjective nature, particularly regarding pain, from an Australian aboriginal. Most relief was of a temporary nature unless injections were repeated and it was considered therefore that in most cases surgical intervention was the safer and surer method.

The results of chemotherapy on the neural involvement have until recently been disappointing. Lesions have progressed despite the sulphone treatment and despite the fact that the general condition of the patient improved. Recent experience with Ciba 1906, however, has encouraged me to believe that we may have in this drug a means of quick entry to the nerve with an effective bacteriostatic or bacteriocidal agent. In the few cases tried where the neural involvement had shown no improvement or was progressing in spite of D.D.S. treatment, response was rapid to Ciba 1906. This effect of Ciba 1906 will encourage further trial of intra-neural hydrocortisone as the brief respite given by the latter should allow time for Ciba 1906 to become effective, control the infection and reaction in the nerve and obviate surgery. Another very satisfactory effect of Ciba 1906 is its effect on the general wellbeing and mental attitude of the patient. The drug may be euphoric but it seems rather that the sulphones produce in a number of patients a low degree of toxicity and mental depression of so slight a nature that it is not noticed by the medical officer and rarely apparent to the patient. This is highly probable because severe toxic symptoms of a like nature do exist in a few. The effects of this low grade toxicity are only noticeable in retrospect when the patient is changed to Ciba 1906 and a much brighter, happier and more co-operative patient emerges.

With this in mind and with the increased availability of Ciba 1906, I am inclined to the view that our standard treatment should now be started with Ciba 1906 for the first year with the possible addition of Etilsul during the early months. Thereafter a change may be made to D.D.S. with Promacetin or I.N.H. plus Thiacetazone as alternatives for D.D.S. where the latter is badly tolerated. Combinations of chemotherapeutic agents may be considered as is practised in the treatment of tuberculosis but hitherto our experience in this direction has been disappointing or shown no advantages except in the combination of I.N.H. with Thiacetazone.

#### SOCIAL AND EPIDEMIOLOGICAL EFFECTS

The vast improvements from the new treatments have had widespread results. The knowledge that cure is a possibility and discharge from the Leprosarium an almost certainty has stopped natives hiding in the bush when they realise they have leprosy. Search and apprehension are no longer carried out by the Police Department. Patients voluntarily offer themselves for treatment or present themselves for inspection if they suspect they are infected. We therefore see cases much earlier and consequently treatment is more effective or more rapidly effective. The need for isolation is however as great as ever because we are not now striving to limit the spread of the disease; our object is its eradication. This can only be done by effective surveillance in the field, by isolation of the infectious patient and adequate treatment before he rejoins his group. The vast distances involved and the sparse population have made effective field surveillance extremely difficult and in the past it has at the best been only sporadic.

As the natives have now almost completely forsaken the bush in our leprosy area and have come to live in and around missions and stations, an opportunity has arisen to improve our work in the field and for this reason among others, a medical officer has been appointed for the special purpose of controlling the endemic diseases of the natives. He will examine all natives to detect leprosy at an early stage and will keep all contacts and discharge cases under a far better surveillance than hitherto we have been able to do. The objective as already stated is the eradication of leprosy from Western Australia and it is hoped that this can be accomplished in the next decade.

The remarks regarding isolation in natives do not necessarily apply to whites. This depends largely on their home conditions. Normally they are admitted to hospital until stabilised on their treatment and, if home conditions permit, discharged there to continue treatment. They may therefore be only a few

months in hospital and the occasion has arisen where good home conditions existed and adequate supervision possible and the patient in consequence has not been admitted to hospital at all. This manner of treatment in the home becomes much more a possibility with drugs of such low toxicity as Ciba 1906 where close supervision of the patient's general health is no longer necessary. An increasing number of our patients outside the hospital or leprosarium are now being put on this drug.

Prophylactic use of B.C.G. has been confined to infants born in the Leprosarium. They are immediately removed from the Leprosarium after birth and placed with a mission or foster parents. They are given B.C.G. against the day the mother may be discharged and claim her infant.

#### EFFECT ON LEPROSARIUM

The date on which the Leprosarium became an effective institution was in 1935. Each year there were more admissions than discharges. Many left the Leprosarium only when they died. Consequently, the number of inmates rose year by year to a peak of 333 in 1951. In 1952 for the first time in its history there were more discharges than admissions, and that has remained the case since. Since the peak in 1951 therefore, there has been a constant decrease in the number of inmates, so that at the end of 1958 there were only 150.

Apart from the two lay Superintendents and their wives and the nursing sisters of a religious order, all the work in the Leprosarium is carried out by the patients. Much of this is skilled work requiring mechanics, electricians, carpenters, butchers, bakers, etc. From the large number of patients it was always possible to get persons physically fit for these jobs and the long stay in the Leprosarium ensured that there was adequate time to train staff in the more skilled jobs.

Now, however, the inmates are sorting themselves out into two distinct groups. Those who are old and feeble and suffering from advanced irreparable lesions, relics of the non-chemotherapeutic days, and a group who are relatively new to the institution, being newly found cases.

The first group is totally unfit for work and the second group nowadays hardly stays long enough for sufficient persons to be trained in the skilled work.

The Leprosarium will therefore be faced very shortly with a need to employ outside labour to continue its daily activities. Such labour can only be drawn with any measure of safety from previously discharged patients.

Table No. 1

Year	New Admissions	Youngest	Oldest	Average Age	No. Lepromatous	No. Tuberculoid
1946	35	10	65	39	33	2
1947	35	8	60	32	33	2
1948	47	10	65	39	42	5
1949	44	13	68	40	37	7
1950	53	5	65	45	41	12
1951	38	8	83	33	30	8
1952	24	6	60	31	22	2
1953	22	12	65	35	19	3
1954	36	11	75	34	15	21
1955	16	14	75	37	11	5
1956	20	7	58	27	12	8
1957	22	11	68	38	11	11
1958	21	11	65	32	16	5

Table No. 2

#### DERBY LEPROSARIUM

*Admissions and Discharges, 1946-1958*

Year	New Admissions	Re-admissions	Discharges*	No. at end of Year
1946	35	6	31	231
1947	35	6	29	238
1948	47	2	20	247
1949	44	3	15	268
1950	53	5	8	305
1951	38	16	6	333
1952	24	11	56	303
1953	22	3	56	262
1954	36	12	48	246
1955	16	9	49	211
1956	20	14	37	198
1957	22	11	44	175
1958	21	20	65	150

\* Excluding deaths and absconded.

**DERBY LEPROSARIUM**  
**WESTERN AUSTRALIA**  
**Appendix XII**

## Admissions and Discharges for the Year 1958, compiled from the Monthly Returns of the Superintendent

Month of Year 1958	Admissions												Discharges												Inmates Remaining in Leprosarium					
	Males						Females						Males						Females						Males		Females		Total Remaining	
	Admitted	Re-Admitted	Total Males	Admitted	Re-Admitted	Total Females	Total Admitted	Discharged Cured	Deceased	Ab-sconded	Discharged	Non-Infectious	Total Males Discharged	Discharged Cured	Deceased	Ab-sconded	Discharged	Non-Infectious	Total Females Discharged	Discharged	Deceased	Ab-sconded	Discharged	Non-Infectious	Total Females					
January	4	3	7	1	...	...	7	24	10	...	...	...	10	34	91	57	148	58	58	...	...	...	...	...						
February	...	...	...	...	...	...	1	3	...	...	...	...	...	1	3	88	89	146	58	58	...	...	...	...	...					
March	...	...	...	1	2	2	1	1	1	...	...	...	1	1	2	90	90	147	57	57	...	...	...	...	...					
April	...	...	...	1	1	2	2	1	1	...	...	...	3	3	3	90	90	147	54	54	...	...	...	...	...					
May	...	...	...	1	1	2	2	1	1	...	...	...	1	1	1	90	90	144	56	56	...	...	...	...	...					
June	...	...	...	1	1	2	2	1	1	...	...	...	1	1	1	90	90	146	56	56	...	...	...	...	...					
July	...	...	...	3	3	6	3	5	2	2	2	2	5	5	2	86	85	141	56	56	...	...	...	...	...					
August	...	...	...	8	3	11	2	13	2	1	1	1	1	1	2	96	96	143	57	57	...	...	...	...	...					
September	...	...	...	...	1	1	1	1	1	1	1	1	1	1	1	1	96	96	154	58	58	...	...	...	...	...				
October	...	...	...	2	2	4	1	2	1	1	1	1	1	1	1	1	95	95	155	59	59	...	...	...	...	...				
November	...	...	...	1	1	2	1	1	1	1	1	1	1	1	1	1	95	95	155	60	60	...	...	...	...	...				
December	...	...	...	1	1	2	1	1	1	1	1	1	1	1	1	1	92	92	150	58	58	...	...	...	...	...				
Total	...	...	...	18	12	30	3	8	11	41	46	...	...	...	...	46	19	...	...	20	66	...	...	...	...	...				

## **Analysis of Admissions and Discharges During 1958**

## Appendix XIII

### REPORT FROM THE LIBRARIAN, PUBLIC HEALTH AND MEDICAL DEPARTMENTS' LIBRARY

To the Commissioner of Public Health.

I have the honour to submit a report on the activities of the library for the year 1958.

The main item of interest in library affairs during 1958 was the opening of the Perth Chest Hospital. This event added a further five sub-libraries to the number served. As at December, 1958, the main sub-libraries were as follows :—

Albany Hospital (Nursing Aide Training).  
Broome Hospital (North-West Service).  
Bunbury Hospital  
Busselton Hospital (Nursing Aide Training).  
Chest Clinic.  
Chest Hospital Laboratory.  
Chest Hospital Main Library.  
Chest Hospital Nurses' Library.  
Chest Hospital, Occupational Therapy.  
Chest Hospital, Pharmacy.  
Child Guidance.  
Collie Hospital (Nurses and Nursing Aide Training).  
Derby Hospital (North-West Service).  
Derby Leprosarium.  
Geraldton Hospital (Nurses' Training).  
Government School of Nursing.  
Health Education Council.  
Infant Health Service.  
Kalgoorlie Hospital (Nurses' Training).  
Katanning Hospital (Nursing Aide Training).  
Meekatharra Hospital (North-West Service).  
Merredin Hospital (Nursing Aide Training).  
Mt. Henry Women's Home (Nursing Aide Training).  
Narrogin Hospital (Nurses' Training).  
Northam Hospital (Nurses' Training).  
Port Hedland Hospital (North-West Service).  
Public Health Laboratories.  
Public Health Laboratories, Bunbury Branch.  
Roebourne Hospital (North-West Service).  
School Medical Service.  
State X-Ray Laboratories.  
Wooroloo Hospital.  
Wyndham Hospital (North-West Service).

In addition, the Library is an ordering agent for the Observatory.

During 1958, in addition to periodicals, series publications, annual reports, etc., the Library received 612 publications. The destinations of these were :—

Public Health and Medical Departments' Library	....	....	246
Chest Hospital Nurses' Library	....	....	67
Infant Health Service	....	....	57
Health Education Council	....	....	35
Child Guidance Clinic	....	....	31
Chest Hospital Library	....	....	25
Public Health Laboratories	....	....	25
State X-Ray Laboratory	....	....	20
Chest Hospital, Occupational Therapy	....	....	16
Chest Hospital Laboratory	....	....	13
Chest Clinic	....	....	13
Nurses' Training Schools	....	....	12
Public Health Laboratory, Bunbury Branch	....	....	12
School Medical Service	....	....	11
North-West Service	....	....	11
Chest Hospital, Pharmacy	....	....	8
Wooroloo Hospital	....	....	6
Government School of Nursing	....	....	2
Chest Physician, Kalgoorlie	....	....	1
Chest Hospital, Radiologist	....	....	1
			612

In addition, the Library received on behalf of the Observatory, 14 publications.

As at 30th November, 1958, the Library was receiving 314 separate journals—more than one copy is received of various nursing journals, hospital journals, etc.

It is of interest to compare these figures, 314 journals and 612 publications, with those of the Medical Library of Western Australia for 1958. Their figures were : approximately 284 journals subscribed to or donated, and 706 books. It is apparent that the total volume of material received was much the same in the two libraries for 1958. It is pleasant again to record the close harmony and co-operation existing between us.

During the year this Library had occasion to borrow 125 items extra-murally, of which 22 were obtained outside the State. As in previous years, the biggest lenders to this Library were the Medical Library (43 items) and the Department of Agriculture Library (26 items).

During 1958 this Library loaned 264 items to outside bodies or individuals. These were made to 20 organisations or persons, the biggest borrower by far being the Medical Library (163 items) followed by the Department of Agriculture (26 items), the University (15 items) and the State Library (14 items). Of these 264 items, journals comprised 222 loans, covering 78 different journals, and texts totalled only 40. The strength of the Library, as is only right, lies in its periodicals.

Comments made in the last report about shortage of accommodation would be totally inadequate to describe the present situation. As will be seen from the list of sub-libraries above and the number of routing and other journal loans (almost 2,500 during 1958). Additional staff is badly needed to cope with the increasing volume of work. As there is pitifully inadequate space for the library material itself, the possibility of further staff for reasonable functioning appears remote indeed until the promised space eventuates.

JOHN F. WOOLCOTT, M.B., Ch.B.,  
Librarian.

## Appendix XIV

To Commissioner of Public Health.

Sir,

I have the honour to submit to you a report on the work done by the Infant Health Service including Pre-School Health for the year 1958.

In 1958 73 per cent. of all babies born in this State attended Infant Health Centres. All birth notifications received from distant and inaccessible areas are passed on to the Correspondence Section, and the response to invitations issued by these Sisters rose to 58 per cent. This figure is considered very encouraging, because some of these Mothers are New Australians, who find it difficult to write, or coloured people—some of them unable to write.

### SURVEY OF WORK DONE IN INFANT HEALTH CENTRES

Individual attendance at Centres	....	....	....	27,663
Gross attendance at Centres	....	....	....	218,134
Visits to Homes	....	....	....	23,330
Advice by letter	....	....	....	361
Advice by telephone	....	....	....	6,999

### CENTRES IN THE STATE AT END OF 1958

	Main Centres	Sub-Centres
Metropolitan	....	32
Country	....	189

There are now 111 Infant Health Buildings which measure up to the present required standard. Many other buildings used for Clinics are not yet satisfactory and these are not included in this figure.

### NEW BUILDINGS

New buildings were opened at :—

Alfred Cove	Mt. Claremont
Bayswater	Mt. Hawthorn
Bassendean	Mt. Lawley
Bedford Park	Mt. Pleasant
Bellevue	Redcliffe
Carlisle	Victoria Park
Cloverdale	Willagee
Leederville	

### RENOVATIONS AND ADDITIONS COMPLETED

Narrogin—extensive renovations.

Albany—extensive renovations and new quarters added.

The Fremantle Municipal Council renamed the Hilton Park Centre “The Mary Salmond Infant Health Centre” in memory of the late Sister Salmond who gave 26 years of service to the Mothers and Babies of the district, and the new Redcliffe Centre was built by the Belmont Road Board as a memorial to the late Dr. Bladen who was the first Medical Officer to that Board.

### UNDER CONSTRUCTION

Pingelly	Wyalkatchem (with quarters)
Osborne Park	Alexander Park

### FUTURE CONSTRUCTION

In 1959 it is hoped to build :—

Millen	Brentwood
Floreat Park	Lockyer
Broome	Ardross
North Innaloo	Mt. Hawthorn (No. 2)
Nollamara	Bentley
Mt. Yokine	

These proposed new Centres are mostly for new suburbs where there are many young married couples, or are to replace sub-standard premises which have been used for years.

The former sub-centre at Allawah Grove had been closed down, but as this area has been re-opened as an experimental housing settlement for coloured Australians, Sister again commenced to visit there. There is an average attendance of 12 babies at the weekly clinic, though the accommodation, as at so many of our sub-centres, is rather cramped and inadequate. It is hoped that in the future we will have a proper building at Allawah Grove. If this eventuates, the large number of pre-school children at the settlement could receive regular health visits from pre-school medical officers and sisters.

### CORRESPONDENCE SECTION

This section of the work continues to increase. Four Sisters paid visits to the Murchison, Eastern Goldfields, Kimberleys and North-West. These trips are very arduous but the response by the Mothers and the Mothercraft Students is so good that the Sisters who do the work feel that the journeys are very

well worthwhile. The weigh centres are still working successfully and reports are arriving regularly so that the Correspondence Sisters are in very close touch with the progress being made by the babies.

It is of interest to note that several of the native and half-caste girls who have done the Schoolgirls' Mothercraft Course by Correspondence, and who have since married and had children, are taking advantage of the Correspondence Infant Health Service.

A Pre-School Sister and a Correspondence Sister visited the following places, with great success :—

Cue (2 visits)	Wittenoom (2 visits)
Mt. Magnet (2 visits)	Paynes Find
Meekatharra (2 visits)	Yalgoo (2 visits)

Other places visited by Correspondence Sisters were :—

Ghooli	Mt. Magnet
No. 8 Pumping Station	Yalgoo
Menzies	Roebourne
Leonora	Port Hedland (2)
Gwalia	Broome (2)
Mt. Ida	Flying Doctor Run
Cosmo Newbery, Laverton	Gordon Downs
Mt. Margaret Mission	Fitzroy Crossing (2)
Mt. Sir Samuel	Hall's Creek (2)
Wiluna	Derby (2)
Meekatharra	Wyndham (2)
Karalundi	Forrest River (by launch)
Cue	Go Go
Moyagee	

A Correspondence Sister trained in Pre-School work visited Broome to see pre-school children and also visited Shark Bay and Carnarvon in lieu of the Mothercraft Sister (on annual leave).

During all these visits to isolated districts our Sisters are on the lookout for trachoma.

With the assistance of the Health Education Council the Correspondence and Pre-School Sisters made a second teaching film on educational diet called "DINNER TIME". This was filmed at Mogumber Mission and it is hoped that, after processing and editing, it will be ready for use early in 1959.

*Summary of work done by Correspondence Section :—*

	Annual Figures
Births reported .... .... .... .... .... ....	592
New babies .... .... .... .... .... ....	370
Requests for advice re babies .... .... .... .... .... ....	3,489
Individual babies .... .... .... .... .... ....	921
Pre-School children—advice .... .... .... .... .... ....	844
Pre-School children individual .... .... .... .... .... ....	678
Expectant mothers—advice re .... .... .... .... .... ....	94
Expectant mothers individual .... .... .... .... .... ....	75
Weigh centres—attendances .... .... .... .... .... ....	1,547
<b>Letters received—</b>	
Mothers .... .... .... .... .... ....	826
Others .... .... .... .... .... ....	466
School Children .... .... .... .... .... ....	3,173
School children lessons .... .... .... .... .... ....	3,454
<b>Letters sent—</b>	
Mothers .... .... .... .... .... ....	3,930
Others .... .... .... .... .... ....	1,479
School children .... .... .... .... .... ....	1,873
School children lessons .... .... .... .... .... ....	4,885
<b>Visits to centre (country)—</b>	
Babies .... .... .... .... .... ....	179
Pre-School .... .... .... .... .... ....	24
Expectant mothers .... .... .... .... .... ....	9
School children .... .... .... .... .... ....	183
School teachers .... .... .... .... .... ....	31
Others .... .... .... .... .... ....	132
<b>Telephone consultations—Inward—</b>	
Country mothers only .... .... .... .... .... ....	34
<b>Children from whom Mothercraft work has been received during the year .... .... .... .... ....</b>	
	<b>267</b>
<b>No.</b>	
Country trips made .... .... .... .... .... ....	6
Country visits made (for filming, etc.) .... .... .... .... ....	6
Films, lectures, demonstrations, etc. .... .... .... .... ....	24
Total audience .... .... .... .... .... ....	1,415
Mothercraft children visited in schools .... .... .... .... ....	276

### MOTHERCRAFT SECTION

Mothercraft Classes for expectant Mothers have shown great progress. This year 114 Mothers were instructed on the care of the infant—more than double last year's figure. Parentcraft Classes also met with success, being conducted at Infant Health Headquarters and at Fremantle Infant Health Centre. Three sessions were held, each one consisting of six weekly lectures and a total of 150 expectant parents attended. The classes were held at night, so that both expectant parents could attend them. Mothercraft lectures continue to be given in State and Private Schools in the Metropolitan area and 29 schools in the country were given the Course of Lectures by their local Infant Health Sisters.

The senior Mothercraft Sister continued to pay a monthly visit to Carnarvon, where Clinics are held for white and coloured mothers, school girls are lectured, homes are visited and a Clinic of the Air is conducted over the pedal wireless, for the benefit of outback mothers. Sister also visited Shark Bay twice to hold Infant Health and Immunisation Clinics.

This Sister also prepared and delivered 32 broadcasts on Infant Care from Perth, these talks being subsequently re-broadcast from Geraldton, Kalgoorlie, and Albany.

#### *Summary of Work done by Mothercraft Section.*

	Metropolitan Schools	No. of Classes	No. of Lectures	Exam.	No. of Students
High Schools ....	....	38	264	7	1,122
Private ....	....	4	38	4	160
		42	303	11	1,282
Kindergarten Trainees and Trainee Teachers	2	12	2	25	
		44	315	13	1,307
Organisations ....	....	4	27	7	86
		48	342	20	1,393
Government School of Nursing	....	4	4	....	61
		52	346	20	1,454
Country ....	....	29	252	5	797
		81	598	25	2,251

As well as the above, the Mothercraft Sisters conducted examinations on three occasions at the Alexandra Home, lectured to four groups of trainees from the Government School of Nursing and gave lectures to Kindergarten Trainees, Trainee Teachers, Girl Guides and St. John Ambulance Cadets.

### TRANS LINE

Five trips were made in 1958 by Mothercraft and Correspondence Sisters. On one trip the Medical Supervisor of Infant Health accompanied the Sisters and examined all school children living along the line. The mothers (many of them New Australians) are far removed from help and advice and greatly appreciate the visits paid by the Child Health Car. The double journey (begun in 1957) has proved much more satisfactory than the single journey.

### SUMMARY OF WORK DONE DURING 1958

0-2 years	....	....	....	....	468
3-6 years	....	....	....	....	428
7-14 years	....	....	....	....	343
Expectant Mothers	....	....	....	....	68
Others	....	....	....	....	241
Individual attendance	....	....	....	....	1,653
Vaccines—					
Salk	....	....	....	....	718
Others	....	....	....	....	269
Gross attendance	....	....	....	....	2,545

### CARAVANS

The four caravans (with 92 stopping places) still do good work in outer metropolitan districts and their visits are much appreciated by Mothers living in these sometimes isolated areas. The work of driving these Caravans is very strenuous and the Sisters, who have to be out in all weathers and often over very rough roads, deserve the greatest credit for the splendid work which they do.

### PRE-SCHOOL SECTION

The Pre-School Section of our Service is growing so rapidly that next year another full-time Sister will be needed. The Pre-School Training Course was not held this year because of Staff shortages, but it is hoped to train at least six Sisters in the not too distant future. If this work is to be allowed to expand as it should, we must have trained staff to cope with it.

This section consists of two branches :—

- (1) Pre-School Examinations in Kindergartens with a full-time Staff of one medical officer and one Sister.
- (2) Pre-School Clinics in Infant Health Centres, with a staff of two full-time, specially trained Infant Health Sisters.

*Summary of Work done in Kindergartens.*

Kindergartens visited .... ....	147
Kindergartens visited twice .... ....	50
Country Kindergartens visited .... ....	18
Gross number of children medically examined .... .... ....	4,088
Conditions notified to Parents .... ....	1,830
Children referred for Medical attention .... ....	751
Children for home attention or observation .... .... ....	615
Not immunised against diphtheria (or doubtful cases) .... ....	94
Undernourished Children .... ....	45
Cases of pediculosis .... ....	2
Home visits by Sister .... ....	148

*Summary of Work done by two Full-time Pre-School Sisters.*

Centres with regular Clinics .... ....	52
Gross attendance .... .... ....	1,997
Broadcasts on Pre-School Child prepared and given .... .... ....	26

As well as the two branches mentioned above, some Sisters specially trained in Pre-School work conduct special Pre-School Clinics in conjunction with Infant Health Clinics in their own Centres. In the Country many Sisters, though not specially trained in Pre-School work, supervise the physical welfare of the toddler as well as the new baby in the family. As will be seen in the appendix to this report 6,944 children over the age of two were seen at Centres throughout the State, as well as the 1,997 seen in special Pre-School Clinics.

STAFF

Full-time Sisters .... .... ....	69
Part-time Sisters .... .... ....	2
Part-time Relievers .... .... ....	3

The Staff shortage was not so serious this year and no Centre was actually closed. However, from April until October there was a vacancy for a Mothercraft Lecturer and, as a result, fewer lectures were given in the Schools. Our position is still rather precarious and we are greatly indebted to former Staff members, either married or retired, who come to our aid so frequently when the position becomes acute. Until "Ngal-a" begins to supply this State with trained Infant Health Sisters, the Staff shortages are inevitable.

Sister McAleer was granted Long Service Leave and Sister Broadley retired after giving years of kindly and efficient service to the Mothers in her various Centres.

ANNUAL REFRESHER COURSE

A successful Refresher Course was held from 26th July, 1958 to 1st August, 1958 and the inaugural lecture was given by Professor W. B. Macdonald, Professor of Child Health at the University of Western Australia. Here I would like to pay tribute on behalf of our Service for all the practical, expert help which Professor Macdonald has given so generously since his arrival in this State.

ADDITIONS TO INFANT HEALTH HEADQUARTERS

The Staff housed in this building has increased greatly since the opening in 1954 and in 1959 we will need to extend the present premises or seek extra accommodation elsewhere until extensions can be made.

LOTTERIES COMMISSION

During the year our Service again received generous contributions from the Commission towards new Infant Health Centre Buildings and also donations of Baby Scales. I offer them our sincere thanks.

This report would be incomplete without mention being made of the excellent work being done by the Sisters in the country districts. Many of them drive over 1,000 miles per month in all weathers, bringing help and advice to Mothers, not only about their babies but often about other aspects of family life.

In conclusion I wish to record my sincere thanks to the members of the Infant Health and Pre-School Service for their loyalty and conscientious work without which the results recorded in this report could not have been achieved.

ELIZABETH M. GIBSON,  
Medical Supervisor of Infant Health.

**ANNUAL SUMMARY, JANUARY - DECEMBER, 1958**

Centres	Gross Number of Attendances					Individual Babies Attended					Visiting Babies			Individual Expectant Mothers	
	Under 12 months	1-2 years	Total 1-2	Over 2 years	Grand Total 3-4	Under 12 months	1-2 years	Total 6-7	Over 2 years	Grand Total 8-9	New Babies	Transfers from other Centres	(14)	(15)	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)	(15)
Metropolitan—															
Applecross	4,395	341	4,136	226	4,962	402	94	496	93	589	178	207	72	7	
Bayswater	...	3,991	208	4,199	4,199	348	36	384	...	384	218	17	38	...	18
Cannington	2,080	69	2,149	...	16	2,165	14	441	42	501	161	176	24	21	21
Caravan No. 1	3,991	211	4,571	384	4,955	260	181	441	42	483	304	272	34	15	6
Caravan No. 2	1,758	258	1,969	67	2,036	163	52	215	42	257	110	140	5	23	39
Caravan No. 3	211	3,416	3,674	86	3,760	213	101	314	45	359	131	128	7	37	40
Caravan No. 4	258	277	3,893	136	4,029	155	281	26	307	160	206	227	46	29	40
Carlisle	...	3,616	3,683	128	3,811	512	46	358	38	596	200	212	32	62	25
Clarendon	...	3,597	86	3,683	63	4,513	202	168	21	391	206	223	33	78	10
Cottesloe	...	4,185	265	4,450	180	4,587	231	165	68	464	241	232	11	65	...
Douglasview No. 1	...	4,263	324	4,587	19	3,557	338	56	12	406	274	232	11	65	10
East Fremantle	...	3,389	168	3,557	19	3,576	394	12	406	253	253	219	28	...	...
Fremantle	...	3,947	193	4,140	83	4,223	431	81	512	40	552	295	29	61	...
Guildford	...	3,856	273	4,129	138	4,267	445	84	529	61	590	254	19	37	7
Gosnells	...	3,684	172	3,866	6	3,872	323	68	391	6	397	250	19	37	2
Hilton Park	...	2,347	277	2,624	454	3,078	174	91	265	258	523	157	17	38	20
Hackett Estate	...	3,094	70	3,164	24	3,188	380	64	444	14	458	340	13	23	20
Inglewood	...	3,278	228	3,606	37	3,643	325	93	418	20	438	197	28	9	34
Kalamunda	...	4,362	160	4,522	16	4,538	367	84	436	14	450	258	30	55	8
Kensington	...	3,014	286	3,300	70	3,370	297	120	417	21	438	225	32	35	16
Leederville	...	5,368	198	5,566	141	5,707	498	94	592	4	596	459	389	44	110
Maylands	...	4,223	37	4,260	1	4,261	1,127	445	1,174	47	362	302	28	19	4
Melville	...	4,552	121	4,673	27	4,700	445	84	529	25	554	281	39	46	1
Midland Junction	...	3,763	357	4,120	425	4,545	392	84	539	393	932	227	251	30	55
Nedlands	...	3,724	193	3,917	40	3,957	372	85	457	7	464	244	17	53	...
North Perth	...	3,542	37	3,919	149	4,068	323	126	394	79	473	210	155	16	87
Osborne Park	...	4,105	275	4,380	208	4,588	447	89	536	121	657	269	270	32	44
Perth	...	3,170	133	3,303	1	3,304	416	91	507	1	508	522	261	68	...
Rockingham	...	3,295	322	4,061	190	4,251	325	91	555	38	393	312	301	56	20
Scarborough	...	2,397	197	2,592	38	2,630	235	73	308	20	328	152	19	53	46
South Perth	...	3,617	175	3,792	149	3,919	297	103	400	400	400	216	31	34	13
Subiaco	...	4,783	213	4,996	10	5,006	435	84	519	10	529	387	313	35	...
Victoria Park	...	3,732	278	4,010	410	4,420	327	192	40	262	9	271	226	256	49
Wembley	...	3,953	126	4,079	9	4,088	222	74	339	11	350	202	193	19	27
West Perth	...	3,470	188	3,658	62	3,720	265	70	1,060	33	119	58	55	13	24
Country—															
Albany	...	...	3,471	180	3,651	125	3,776	347	73	420	69	489	291	235	3
Beverley	...	...	1,895	259	2,154	164	2,318	244	80	324	61	385	282	13	19
Boulder	...	...	2,316	118	2,434	96	2,530	193	38	231	51	460	220	153	22
Bruecktown	...	...	3,111	332	3,443	108	3,551	274	127	401	59	417	208	202	14
Bruce Rock	...	...	2,965	142	3,107	19	3,126	357	44	401	16	471	208	226	24
Bunbury	...	...	4,743	195	4,938	33	4,971	471	76	547	32	579	334	314	1
Busselton	...	...	3,912	375	4,287	77	4,364	269	124	393	28	421	248	232	8
Collie	...	...	3,107	279	3,386	273	3,659	309	57	366	30	396	229	182	12
Corrigin	...	...	3,622	878	4,500	1,397	5,897	203	117	320	117	600	131	195	6
Carnarvon	...	...	418	88	506	73	579	65	123	29	152	92	72	9	20
Esperance	...	...	547	89	636	66	702	33	22	20	30	30	30	3	27
Geraldton	...	...	3,922	150	4,072	9	4,081	214	474	19	493	378	296	11	53
Harvey	...	...	2,699	89	2,788	47	2,835	248	80	324	30	332	211	182	13
Kalgan	...	...	4,685	371	5,056	266	5,322	310	57	332	120	542	373	278	5
Katanning	...	...	2,294	171	2,465	58	2,523	313	22	401	59	360	261	185	15
Kellerberrin	...	...	1,683	184	1,867	469	2,136	202	63	401	16	471	199	147	19
Manjimup	...	...	3,216	366	3,582	405	3,987	219	69	288	60	348	73	265	18
Mingenew	...	...	3,486	434	3,920	340	4,260	245	150	395	129	515	245	245	25
Moora	...	...	3,071	312	3,383	310	3,545	499	72	571	50	621	258	224	36
Mt. Barker	...	...	2,160	331	2,491	478	2,969	249	54	303	96	399	205	157	75
Narrogin	...	...	2,489	238	2,727	108	2,835	381	116	497	42	539	259	207	13



## Appendix XV

### SCHOOL MEDICAL SERVICE

An effort has been made during the year to convert the metropolitan area examinations into the new scheme of three examinations in the child's school years at the selected ages of, at entry, between the ages of seven and nine, and just prior to leaving school. This change-over can only be done gradually with the staff available because it can only be commenced in a school subsequent to an examination of every child in the school, otherwise in the change-over certain children may miss out on examination for a number of years.

The arrival of an additional Medical Officer to Region 3 in July has assisted considerably and the change-over in that Region is nearly complete.

Many country schools are now up to date on a two-year schedule and all have been examined within three years.

A total of 37,569 children were examined, of whom 14,418 were in the country. The parents of 14,676 were notified of some defect or other, including dental defects. Four thousand four hundred and thirty-six were referred for medical attention. Table II shows a good response by the parents in obtaining this medical attention.

A total of 68,756 children were examined for pediculosis (Table III) and the number notified as infected was 286. The main centres of infestation are native children in country schools. Revisits to ensure that effective treatment had been carried out brought the total number of head inspections up to 168,014.

During the year 326 parents were interviewed by the School Medical Officers.

The general health and nutrition of the children remain good.

The heights and weights of 20,223 boys and 19,119 girls aged 6-14 years were recorded. No appreciable difference was noticeable between metropolitan and country children.

Heights and weights are given in Tables IV and V and it should be noted that throughout the age range in both boys and girls there is an increase in height of over an inch and a corresponding increase in weight since the last major analysis of heights and weights in 1940.

It is interesting to note that the heights and weights of the Western Australian school children in 1940 and in 1958 are almost identical with London County Council school children in the respective years 1938 and 1954, whereas the children of Canada in 1953 correspond in stature only with Western Australian children in 1940 and London County Council children in 1938. It would seem therefore that Canada lags a bit in the general increase in height and weight of school children that is apparent in a number of countries.

Californian children begin to go ahead of Western Australian children after the age of 9 or 10. Because our tables end at 14 years, we cannot say if this is an indication of greater stature in the population or merely an indication of earlier maturity.

#### HEIGHT AND WEIGHT REFERENCES

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Table I

## EXAMINATION OF METROPOLITAN AND COUNTRY SCHOOL CHILDREN, 1958

	Number Examined	Number Notified	Number Referred for Medical Attention	Number Referred for Home Attention and Observation	Number Requiring Dental Attention	Skin Complaints		Nutrition			Eyes Medical Attention	Tonsils Medical Attention
						Number	Per cent.	3	Under 3	Over 3		
<i>Metropolitan Schools</i>												
Boys ....	11,963	3,979	1,081	1,317	2,305	....	....	10,970	244	749	....	....
Girls ....	11,188	3,688	1,053	1,251	2,143	....	....	9,821	375	992	....	....
Total ....	23,151	7,667	2,134	2,568	4,448	1,390	6·00	20,791	619	1,741	1,082	290
<i>Country Schools</i>												
Boys ....	7,468	3,519	1,167	1,060	2,139	....	....	6,730	201	524	....	....
Girls ....	6,950	3,490	1,135	1,252	2,049	....	....	5,859	261	820	....	....
Total ....	14,418	7,009	2,302	2,312	4,188	1,615	11·20	12,589	462	1,344	1,315	289
<i>State Total</i>												
Boys ....	19,431	7,498	2,248	2,377	4,444	....	....	17,700	445	1,273	....	....
Girls ....	18,138	7,178	2,188	2,503	4,192	....	....	15,680	636	1,812	....	....
Total ....	37,569	14,676	4,436	4,880	8,636	3,005	7·99	33,380	1,081	3,085	2,397	579

Table II

## HOME VISITING BY SCHOOL NURSES, 1958

Total Visits re Medical Attention	Received Attention	Promised Attention	Disinterested	Out or Left District	Visit to Cases Referred for Home Attention	Parents Phoned or Called Office
2,999	1,181	924	25	961	45	192

Country Areas : 234 visits made.

Table III

## HYGIENE INSPECTION BY NURSES FOR PEDICULOSIS

		No. of Children Examined	Number Notified	Percentage
Metropolitan	....	53,785	106	.19
Country	....	14,971	180	1·20
Total	....	68,756	286	.41

Including Revisits to above, a total number of 168,014 Heads were examined or re-examined.

HEIGHT AND WEIGHT SURVEY

Table IV

*Height : Boys*  
(Inches)

Age Last Birthday	West Australia	London County Council	West Australia	London County Council	New South Wales	Queensland	Victoria	California	Canada
	1940	1938	1958	1954	1954	1950	1952	1956	1953
5	43.0	43.0	....	43.8	44.03	44.10	44.65	43.7	41.9
6	45.0	45.2	46.0	46.0	46.43	46.38	46.90	45.8	44.6
7	47.0	47.4	48.0	48.8	48.82	48.43	49.25	48.7	47.0
8	49.2	49.5	50.5	50.8	51.09	50.64	51.35	50.9	49.1
9	51.2	51.5	52.8	52.8	53.02	52.54	53.20	53.1	51.3
10	53.0	53.5	54.5	54.8	54.88	54.32	55.00	55.3	53.5
11	54.8	55.3	56.5	56.5	56.73	56.04	56.80	57.5	55.4
12	57.0	57.0	58.2	58.5	58.56	58.01	58.65	59.1	57.4
13	59.0	58.7	60.8	60.8	61.05	60.27	61.25	61.4	59.3
14	61.5	....	63.5	63.5	63.61	62.88	63.90	64.6	62.2

*Height : Girls*  
(Inches)

Age Last Birthday	West Australia	London County Council	West Australia	London County Council	New South Wales	Queensland	Victoria	California	Canada
	1940	1938	1958	1954	1954	1950	1952	1956	1953
5	43.5	42.7	....	43.5	43.74	43.79	44.30	43.1	41.8
6	44.5	44.8	45.8	45.8	46.32	45.94	46.50	45.9	44.2
7	46.8	47.0	48.0	48.2	48.52	48.25	48.85	48.1	46.5
8	49.0	49.1	50.8	50.2	50.71	50.18	50.95	50.4	48.9
9	51.0	51.3	52.2	52.5	52.67	52.32	53.00	52.7	51.0
10	53.0	53.4	54.0	54.5	54.84	54.47	55.10	55.1	53.3
11	55.2	55.6	56.2	57.0	57.47	56.87	57.40	57.5	55.3
12	57.8	57.8	58.8	59.2	59.41	59.24	59.95	60.7	58.2
13	60.0	59.9	61.5	61.2	61.50	60.88	62.00	63.0	60.4
14	61.5	....	62.8	62.8	62.62	62.34	63.20	64.2	61.3

Table No. 5  
HEIGHT AND WEIGHT SURVEY

*Weight : Boys*  
(Lb.)

Age Last Birthday	West Australia	London County Council	West Australia	London County Council	New South Wales	Queensland	Victoria	California	Canada
	1940	1938	1958	1954	1954	1950	1952	1956	1953
5	41.2	42.7	....	43.8	45.51	43.55	45.95	42.8	40.0
6	44.0	47.2	48.2	49.0	50.14	47.72	50.85	47.6	46.0
7	48.5	52.1	53.0	55.2	55.73	52.43	56.05	52.9	50.0
8	53.5	57.5	59.2	61.0	61.37	58.30	61.85	58.2	57.0
9	58.5	63.2	65.0	66.8	67.56	63.96	67.30	66.8	63.0
10	64.0	69.3	71.0	73.2	74.10	68.87	73.30	74.1	70.0
11	70.0	75.9	78.5	80.2	80.37	75.83	79.75	82.2	77.0
12	77.0	83.0	86.2	89.0	89.01	83.69	88.00	91.3	84.0
13	84.8	90.5	98.0	97.8	100.08	94.12	98.85	101.4	94.0
14	95.8	....	110.5	112.0	112.84	105.72	112.20	116.0	108.0

*Weight : Girls*  
(Lb.)

Age Last Birthday	West Australia	London County Council	West Australia	London County Council	New South Wales	Queensland	Victoria	California	Canada
	1940	1938	1958	1954	1954	1950	1952	1956	1953
5	41.8	41.6	....	42.8	44.36	42.08	44.70	41.2	41.0
6	43.2	45.8	47.0	48.2	49.74	46.91	49.15	46.7	44.0
7	47.5	50.6	52.2	53.5	55.36	51.93	54.85	52.9	49.0
8	52.5	56.0	59.0	59.2	60.90	56.85	60.20	60.0	57.0
9	58.2	62.2	64.2	65.8	67.69	63.20	66.50	66.4	62.0
10	64.0	69.1	71.2	73.0	74.95	70.67	73.85	76.1	69.0
11	71.5	77.1	81.5	81.2	84.12	79.87	81.80	86.6	77.0
12	81.0	86.1	91.5	92.0	94.00	89.82	92.30	99.2	92.0
13	92.0	96.5	104.2	101.8	106.36	99.77	103.35	112.4	102.0
14	101.5	....	113.8	112.2	115.11	106.76	112.95	121.0	107.0

## Appendix XVI

### REPORT ON OPHTHALMIC WORK IN 1958

### PROFESSOR IDA MANN

The work falls into the following parts :—

1. The Trachoma Problem.
2. The Partially-sighted class.
3. Instruction.
4. Visit to United States and England, re
  - (a) possible sources of trachoma in migrants ;
  - (b) investigation of new anti trachoma drugs ;
  - (c) investigation of American and English work on Low Vision clinics.

#### TRACHOMA

1. Throughout the greater part of the year, Sister King and Mrs. Mezger travelled over large areas of the State distributing sulfa drugs and instructing in their use on natives. Sister Tremearne was appointed Matron at Laverton and undertook the treatment of the Warburton tribe of natives in Laverton and Mount Margaret Mission. At the end of the year Sister King got a job in England and Mrs. Mezger returned to Melbourne. Sister Cahill was appointed in her place.

In August-September I did a follow-up survey in the Kimberleys and elsewhere and came to the following conclusions :—

1. Annual treatment in the first term of the year of all native children in schools (together with treatment of new entrants) is having a very good effect on the incidence of active trachoma. Almost all school children appear cured by the time they leave school.
2. Treatment of station natives is having little effect as they are all being treated at different times and treatment depends on the conscientiousness of the station managers.
3. Pre-school children are the greatest source of infection now.
4. An easier form of treatment is required.

In the United States I visited the Research Department of Lederle's, and investigated the possibilities of Lederkyn (a long acting sulfa of very low toxicity), and on my return instituted clinical trials in and around Perth. The results were quite as good as with the other sulfa drugs. The real advantage lay in the fact that only one dose a day is required and a triple dose can be given on Fridays to obviate weekend treatment.

It has therefore been decided to switch to Lederkyn and to institute a new method of procedure to take effect from February-March, 1959.

2. The success of the Partially-Sighted Class continues. Twenty-nine children passed through this class in 1958. Fourteen of them have improved sufficiently to attend normal classes. The chief difficulty is that of getting country children into the class.

3. Courses of instruction in eye diseases of children have been given to District and School Medical Officers, Infant Health Nurses and School Nurses.

4. In England the percentage of trachoma in orphanages sending child migrants to Australia was investigated. It was very rare and practically only occurred in children from India, the Middle East or Ireland. Arrangements were made with Australia House to alert the doctors engaged in examining would-be migrants as to the position.

In England and United States enquiries were made re Low Vision clinics. An investigation is under way as to the need for such a service here, but at present there is little evidence that it would be worth while as the number of cases likely to benefit here is very small.

## Appendix XVII

### *The Commissioner of Public Health.*

Following is my report on the activities of the school Dental Service for the year ended December, 1958.

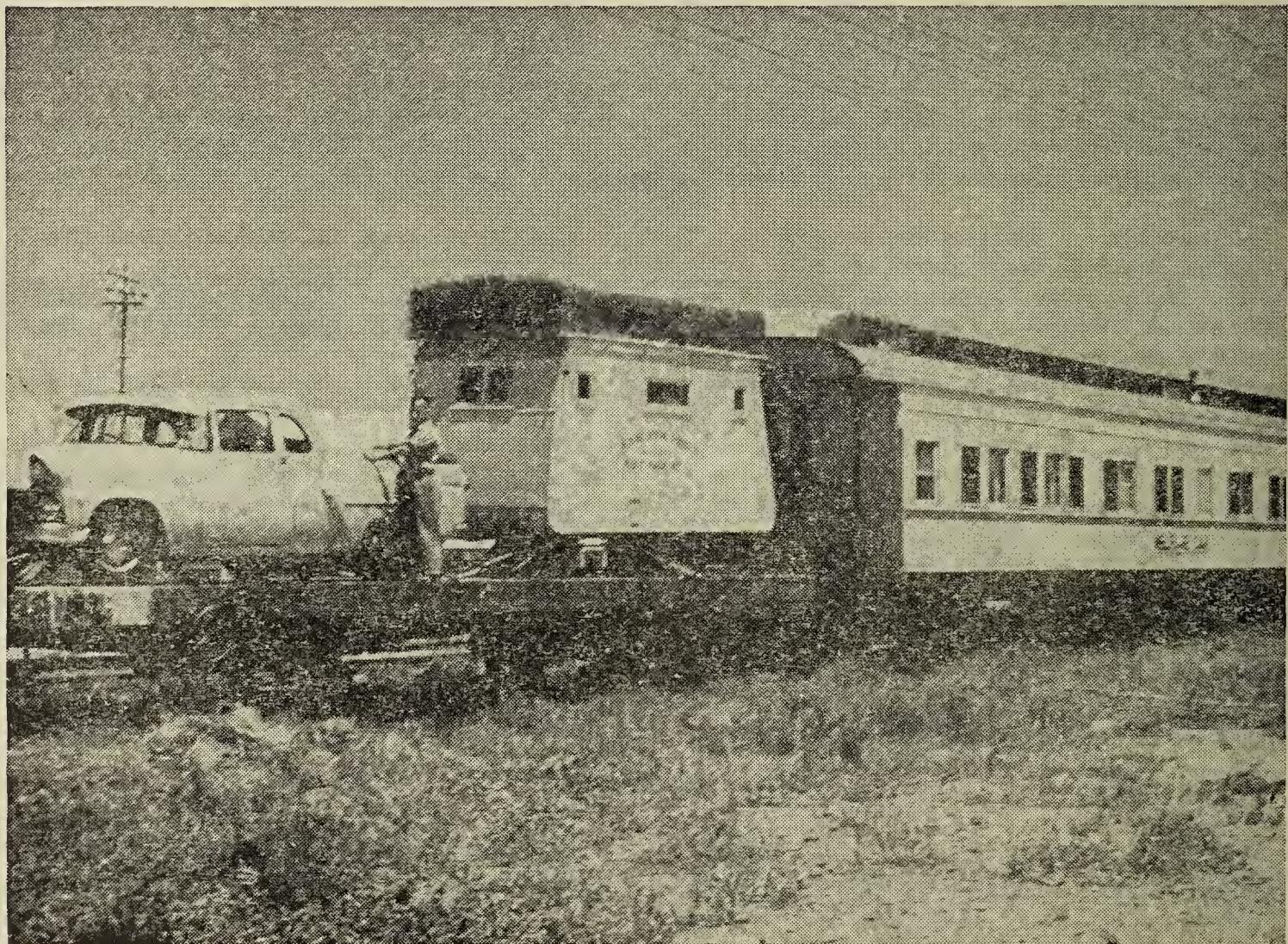
Staff numbers remained constant although the personnel changed slightly, so with a full establishment we are gradually giving a better service to country districts ; however, the age limits at the larger schools must remain in force until more dentists are provided.

Although Broome is visited annually during the winter months by the Flying Doctor Service Mobile Clinic and we had helped a Perth private dentist to practise there for a few weeks in October, 1957, I received a request by representatives of the pearlimg industry for a dentist to visit that town during the pearlimg lay-off season. Knowing that private dentist T. Ellies intended to spend a holiday in Broome some time during the year I persuaded him to go in early February (despite the heat) and to do some dental work while he was there ; employees of the pearlimg industry were thus able to obtain treatment and, in exchange for the use of heavy equipment which we already had in store in Broome, Mr. Ellies treated all children brought along to him free of charge.

During the year treatment was undertaken for quite a number of pre-school children who were brought along to our mobile surgeries ; and emergency treatment (mainly extractions) was given to a good many adults in places where no private dentists operated.

On a few occasions treatment was given to inmates of "Sunset" who were bedridden and so unable to be taken to the Dental Hospital.

On a couple of occasions in previous years Dental Officers have visited sidings along the Trans-Australia Railway Line, but the living conditions were deplorable—the dentist was expected to sleep anywhere, prepare his own meals or cadge them and, at the same time, do his own professional work. This year we obtained the use of the Commonwealth Railways Welfare Coach in which the Dental Officer and his wife lived ; the latter attended to her usual household duties while the dentist worked in his mobile surgery which was alongside—on a flat top truck coupled to the living coach. On completion of work at each place the vehicles were moved to the next siding by the next available goods train. A photograph of the ensemble appears with this report.



Figures concerning the service for 1958 are :—

Number of country schools visited	....	....	....	....	....	....	157
Number of metropolitan schools visited	....	....	....	....	....	....	15
Number of native missions visited	....	....	....	....	....	....	13
Number of orphanages visited	....	....	....	....	....	....	11
Number of children examined	....	....	....	....	....	....	13,502
Number of children treated	....	....	....	....	....	....	7,744
Number of children needing no treatment	....	....	....	....	....	....	4,308
Number of children who were to receive treatment by private dentists	....	....	....	....	....	....	605
Number of children whose parents did not bother to reply to notices sent out	....	....	....	....	....	....	845

Dental operations performed :—

Silver amalgam fillings	....	....	....	....	....	....	9,552
Copper amalgam fillings	....	....	....	....	....	....	1,883
Cement fillings	....	....	....	....	....	....	1,280
Porcelain fillings	....	....	....	....	....	....	1,110
Silver nitrate treatments	....	....	....	....	....	....	1,960
Other conservative treatments	....	....	....	....	....	....	5,094
Extractions	....	....	....	....	....	....	14,735
Prophylaxis	....	....	....	....	....	....	1,275
Gold inlays	....	....	....	....	....	....	2
Dentures	....	....	....	....	....	....	19
Orthodontic treatment	....	....	....	....	....	....	12
Pulp (nerve) treatments	....	....	....	....	....	....	170
X-ray photographs taken	....	....	....	....	....	....	11
Talks to P. & C. Associations, personal interviews, etc.	....	....	....	....	....	....	381

A. G. McKENNA,  
Senior Dental Officer.

## Appendix XVIII

### REPORT BY THE CHIEF INSPECTOR

*The Commissioner of Public Health.*

Submitted herewith is a summary of the work of the Inspection Branch during 1958.

#### ENVIRONMENTAL SANITATION

There were 594 inspections made throughout the State during the year. They covered a wide range of investigation and included 81 town surveys; nine investigations into appeals lodged under Section 37 of the Health Act; the examination of 256 areas intended as new housing sub-divisions and 91 inspections of public buildings including hospitals.

The surveillance of swimming places continued and 360 samples of water were submitted for bacteriological or chemical examination.

Seven thousand, eight hundred and thirty-four small sewage treatment tanks were approved. Many of these installations were designed to treat both sewage and sullage. These units treating combined wastes function efficiently and are being used in greater numbers each year. Experimental tanks of this type installed seven years ago have worked well ever since without maintenance of any sort.

Pest control officers made 259 visits to Government institutions for the control of rats, opossums, pigeons and insect pests. Except for one infestation of poultry mites in a classroom arising from pigeons nesting in the roof space, no unusual problems were encountered.

#### FOOD AND DRUGS

The total of animals slaughtered for human consumption as shown in Appendix XXVII continues to increase.

Inspections of carcases in metropolitan abattoirs carried out by departmental officers show the following increases over the 1957 figures:—

		1957	1958	Per cent. increase
Cattle	....	80,573	91,691	13·8
Calves	....	4,865	6,332	30·1
Sheep	....	817,714	882,707	7·9
Pigs	....	146,583	173,385	18·2

Imported food was inspected at Fremantle Wharf and included the check sampling of over 1,000 tons of fish. Several consignments of fish were rejected because they contained undeclared dyestuffs.

Meat arriving from the North-West and intended for local consumption was also inspected at this centre.

One hundred and seventeen samples of food and drugs were submitted for bacteriological examination or chemical analysis.

#### PESTICIDE REGISTRATION

New products for the control of agricultural and household pests continue to appear on the market; some are entirely new chemicals, while others are modifications or new formulations of insecticides which have been in use for many years.

One hundred and thirty-nine new products were approved for registration by the Pesticide Advisory Committee, bringing the total number of pesticides registered with the Department to 765.

#### HEALTH INSPECTORS' CONFERENCE

The Annual Health Inspectors' Conference was held at St. John Ambulance Headquarters, Perth, on 25th and 26th September. Inspectors from both metropolitan and country centres attended.

The Conference was opened by Dr. Linley Henzell, Commissioner of Public Health, who gave a resume of recent developments in public health organization and legislation.

The following addresses were given:—

- “Food and Drug Regulations” (Mr. C. E. Flower, Chief Inspector, Public Health Department).
- “Civil Defence Organization” (Mr. W. Lonnie, Deputy Director of Civil Defence).
- “Medical Aspects of Atomic Radiation” (Dr. W. S. Davidson, Deputy Commissioner of Public Health).
- “The Role of the Health Inspector in Civil Defence” Mr. A. Marsh, Health Inspector, Mundaring; Mr. H. Salter, Chief Inspector, Perth City Council; Mr. A. W. Wilson, Health Inspector, Public Health Department).

A film dealing with the “Tetrapak” Milk Pack was shown and was followed by a demonstration of this type of packaging at a metropolitan milk depot.

Two films, “The Atom and You” and “Tale of Two Cities,” were shown in association with the addresses on Civil Defence.

On 26th September the delegates were taken on a conducted tour of a factory where asbestos cement products were manufactured.

C. E. FLOWER,

Chief Inspector.

**Appendix XIX**  
**ANNUAL REPORT FOR 1958**  
**NURSING SECTION**

*Commissioner of Public Health.*

**APPOINTMENT OF ASSISTANT MATRON (INSPECTIONS)**

Miss M. E. Beard was appointed Assistant Matron (Inspections) on 23rd June, 1958. Miss Beard was formerly a member of the Infant Health Service of Western Australia.

**HOSPITAL STAFFING**

It is pleasing to report that, in general, staffing of Hospitals during the year has been easier. Those hospitals affected by climatic conditions have fluctuated in their establishments. The Board and Departmental Hospitals averaging 25 to 30 beds have been well-staffed but there still remains the problem of the small (that is under 20 bed) Board and Departmental Hospital, which frequently has to function with one Trained Nurse and Nurse Assistants. Trained Nurses are inclined to accept positions for longer periods than has been apparent for a few years.

In our larger Hospitals there is very little turnover in Matronships and it is gratifying to note that those holding the Diploma of Nursing Administration have retained their appointments.

**NURSING BURSARIES AS AT 31st DECEMBER, 1958**

Bursaries Granted for years—	Number Granted	Withdrawals		Expected Number of Graduate Nurses to be available for years—						
		Number	Percentage	1959	1960	1961	1962	1963	1964	Total
1955 and 1955–56 ....	45	13	28.9	8	22	2	....	....	....	32
1956 and 1956–57 ....	40	7	17.5	....	2	30	1	....	....	33
1957 and 1957–58 ....	67	8	11.9	....	....	7	50	2	....	59
1958 and 1958–59 ....	52	1	1.9	....	....	1	2	47	1	51
Total .... ....	204	29	14.2	8	24	40	53	49	1	175

**SCHOLARSHIPS AWARDED FOR POST GRADUATE STUDY**

Scholarships were awarded to two Male Nurses : to Mr. W. H. Maldon of the staff of the Government School of Nursing for Sister Tutor Diploma Course and Mr. H. G. Jefferies, Kalgoorlie Hospital Staff, for the Theatre Management and Teaching Diploma Course.

The Scholarships this year took the form of grants covering salary, fares between Perth and Melbourne and College fees.

**SPECIAL NURSING RECRUITMENT SCHEME**

The nurses who were brought from England under the Special Nursing Recruitment Scheme completed their contracts during the year. There are now no nurses employed under contract.

**INSPECTIONS**

Visits to Country Hospitals were restricted owing to special circumstances. Forty-two Hospitals were visited during the year.

*Private Hospitals and Maternity Homes.*

Routine inspections of Private Hospitals and Maternity Homes were carried out. Number of inspections : 124.

**NEW REGISTRATIONS OF "C" CLASS HOSPITALS**

		Number of beds
"Jalon," 49 Goldsworthy Road, Claremont ....	....	20
"Vailima," 18 Havelock Street, Narrogin ....	....	12
"St. Catherines," 131 Broadway, Nedlands ....	....	12
"Mt. Lawley," 26 Queens Crescent, Mt. Lawley ....	....	13
"Lesmurdie," Lesmurdie .... .... .... .... ....	....	9

There are six proposed "C" Class Hospitals in the preliminary inspection stage :—

"Eleanor Harvey," 25 Davies Road, Claremont ....	....	11
"Eden," 9 Hillview Road, Mount Lawley ....	....	14
"Deloraine," Cnr. Field Street and Queens Crescent, Mount Lawley .... .... .... .... ....	....	18
"Victoria," 61 Victoria Avenue, Claremont ....	....	18

## NURSE TRAINING

### *Publicity and Recruitment.*

Miss E. E. Harler, Organiser of Nurse Training, has been very active during the year in carrying out routine visits to all High Schools in the metropolitan area and the South-West, Geraldton and Goldfields districts, including Private Schools. Films and talks were given on all aspects of Nurse Training and Nursing Bursaries. Many enquiries were made by letter, telephone and personal interview.

### *Government School of Nursing.*

Although excellent conditions are provided at the Government School of Nursing, a better service could be given if the accommodation were increased. At the present time a number of students have to live at Irwin Court and travel daily to the School and at week-ends take their meals at Royal Perth Hospital. Less staff would be required and supervision would be improved if the whole group of "Block" students could be accommodated with the Junior Nurses at the School.

The School continues to function with only one diplomaed Tutor, but excellent teaching is given by experienced Sisters.

### *Training Hospitals.*

Kalgoorlie Hospital continues to train a satisfactory number of nurses and local recruitment is maintained.

Geraldton Hospital has functioned as a Training Hospital under difficulties, in that accommodation is limited and during staff shortages Sister Irvine, the Tutor, has been forced to assume other responsibilities.

The training at Northam Hospital has improved with the appointment of a full-time Tutor and recruitment to this hospital has increased.

Collie Hospital has suffered from a very high wastage as students have been found to be reluctant to transfer to Kalgoorlie Hospital on completion of the 1st year of training. It was decided to apply to the Nurses' Registration Board for registration as a training school for Nursing Aides. The Hospital is still registered as a General Training School.

A similar situation in respect of wastage and general training has affected recruitment to the Narrogin District Hospital and this has led to a lapse in training at this Centre.

Two Pupil Midwives from the King Edward Memorial Hospital have passed through the Preliminary Training School and First Year "Block" this year.

### *Repatriation General Hospital.*

The Government School of Nursing is indebted to the Repatriation General Hospital for providing practical experience to the students in the Preliminary Training School. Valuable experience is also given to the Senior Nurses, who are given Instrument Lectures and Observation Tours are arranged for them. Nurses from Geraldton and Northam Hospitals have the advantage of two weeks Theatre experience.

### *Visits to General Training Hospitals and Nursing Aide Schools.*

Kalgoorlie	....	....	....	....	1
Geraldton	....	....	....	....	1
Northam	....	....	....	....	2
Katanning	....	....	....	....	2
Merredin	....	....	....	....	1
Narrogin	....	....	....	....	2
Busselton	....	....	....	....	2
Collie	....	....	....	....	2
Albany	....	....	....	....	2
Mount Henry	....	....	....	....	3

### *General Nurses in Training, 1958.*

General Training	....	....	....	158
Commenced Training	....	....	....	76
Completed Training	....	....	....	30
2 Credits.				
1 Failed Surgical Nursing.				

### *Terminations.*

Resigned	....	....	....	....	9
Terminated	....	....	....	....	16
Transferred to Nursing Aides	....	....	....	....	2

### *Nursing Aides in Training : 102.*

Completed Training	....	....	58
Resigned	....	....	13
Terminated	....	....	9

PHYLLIS F. LEE,

6th July, 1959.

Principal Matron.

## Appendix XX

### NURSES REGISTRATION BOARD

Eleven meetings were held at the Department of Public Health.

The number of nurses in the various divisions of the register, and nursing aides on the roll, whose registrations or enrolments were in force at 31st January (the date on which the register and roll were taken out for publication) was :—

General	....	....	....	....	....	....	3,021
Midwifery	....	....	....	....	....	....	2,514
Infant Health	....	....	....	....	....	....	227
Mental	....	....	....	....	....	....	80
Tuberculosis	....	....	....	....	....	....	91
Mothercraft	....	....	....	....	....	....	64
Nursing Aides	....	....	....	....	....	....	306
Dental	....	....	....	....	....	....	26

Sixteen examinations for registration were conducted as follows :—

General nurses	....	....	....	....	....	....	3
Midwifery nurses	....	....	....	....	....	....	3
Mental	....	....	....	....	....	....	3
Tuberculosis	....	....	....	....	....	....	3
Mothercraft	....	....	....	....	....	....	3
Dental	....	....	....	....	....	....	1

Three examinations for enrolment were conducted for nursing aides.

Three First Year Professional Examinations in the subjects of Anatomy and Physiology, Personal and Communal Health, and Junior General Nursing, were held for general nurses.

In January and July, respectively, the Board approved the recognition of—(a) the Repatriation General Hospital for the training of nursing aides and (b) the new Perth Chest Hospital for the training of tuberculosis nurses.

M. TULLY,  
Secretary.

## Appendix XXI

### ANNUAL REPORT OF THE PUBLIC HEALTH DEPARTMENT OF MEDICAL PHOTOGRAPHY

To the Commissioner of Public Health.

I have the honour to report on activities for the year ending 31st December, 1958.

During the year, photographic services were given to the following :—

1. Public Health Department
2. Fremantle Hospital
3. Princess Margaret Hospital
4. King Edward Memorial Hospital
5. Department of Child Health
6. Perth Chest Hospital
7. Consultants in Private Practice.

and a total of 718 requests for photography were received. Medical photographs of 369 patients were taken, and 4,474 transparencies plus 6,370 prints were produced. In addition a minimum of 4,939 recorded miles were travelled whilst carrying out these duties.

Work included clinical photography of patients, photo-keratography, specialised eye photography, photography in the operating theatre of surgical techniques, abnormalities and diseases apparent at surgery, photomicrography, post mortem dissections, reproduction of radiographs, and other transparencies, photo-cystoscopy and other photography of a general nature.

In September, this Department vacated its temporary accommodation in the Fremantle Hospital and moved into new accommodation in the fourth floor, of the Perth Chest Hospital.

Mid-year, the Senior Medical Photographer was elected a Fellow of the Royal Photographic Society of Great Britain (Medical) after submission of work and a thesis. Subsequently he was invited by Dr. B. Stanton, the Chairman of the Medical Group to place on exhibition in London a collection of medical photographic material and written articles, as a one-man exhibition. This was shown in October for one week, and aroused favourable comment.

During the Perth Hospital Week, this Department exhibited a stand showing diseases and abnormalities of the external eye, which included a serial recording of a corneal transplant. The exhibition was prepared and shown in October, with the co-operation of Dr. Adrian Lamb, Senior Honorary Ophthalmological Surgeon at the Royal Perth Hospital.

In January, a paper entitled "The Use of Electronic Flash in Photomicrography of Stained Slides" was published in the "Medical and Biological Illustration Volume VIII, No. 1, 1958." Also in December, the Editorial Committee of the "American Journal of Radiology" gave notification of its acceptance of a paper "The Reproduction of Radiographs," in which the Senior Medical Photographer was joined in authorship by Dr. Charles Stuart, M.C., M.B., B.S., D.M.R., M.C.R.A.

R. PLUMMER,  
Senior Medical Photographer.

## Appendix XXII

### HEALTH EDUCATION

During this year the Health Education Council continued the State-wide programme on reducing accidents at home. Community projects were conducted at Medina, Morawa, Narrogin, Perenjori and York, with varying success. Programmes are planned for Mount Barker, Denmark, Cranbrook, Boyup Brook, Three Springs, Wongan Hills and Bridgetown.

In view of limited staff and the limitations imposed by the considerable amount of travelling over long distances necessary in this State, attempts were made to use "short-cut" methods in stimulating and conducting these programmes, but it was found that unless adequate preparation of communities was done before the programmes were commenced they did not have the same effect in achieving accident reductions over the total communities as was experienced in the original Corrigin project.

The co-operation of the Infant Health Service in stimulating programmes was then enlisted and it seems that this Service will play a significant part in future community health education activities undertaken by the Council.

The normal public relations programme using the Press, Radio and other mass communications media (including talks to local groups on their request) was continued. The Federation of Commercial Broadcasting Stations donated time worth more than £5,000 to publicise the location of Polio Immunisation Units and continued to donate time for health education broadcasts.

The States' Health Education Co-ordination Committee met in Perth in February, 1958. This committee comprises health education personnel from all States and this year included Commonwealth representation for the first time. This committee is of considerable value in helping health education people in the various States and the Commonwealth exchange ideas and discuss mutual problems. There are indications that the annual meeting of the committee will be changed to a biennial meeting.

In October, 1958, a Bill was introduced in Parliament to establish the Health Education Council as a corporate body. This is considered a significant step forward in the development of health education of the people in Western Australia. The Act was assented to on 27th November, 1958, and it is anticipated that the Act will be proclaimed early in 1959. The Council will then function independently of, but of course in close collaboration with, the Department of Public Health.

There is a need for adequate training of health workers in modern principles and methods of health education. Facilities for training in Australia are undoubtedly inadequate. There is no training school. Very few individuals in Australia are capable of training health workers in health education and this is regarded as a serious obstacle to the use by health departments of health education as a major instrument in the reduction of public health problems facing the community. Recommendations have been made to the Commonwealth Health Department by the National Health and Medical Research Council, the States' Health Education Co-ordination Committee and the various State Departments of Health in an effort to have a health education teaching unit established under Commonwealth auspices at the Sydney School of Tropical Medicine. No result has been achieved so far but it is hoped that the Commonwealth will establish this unit within the next two years.

Co-operation between the Council and the Public Health Department continued at its previous high level.

J. T. CARR, Executive Officer,  
Health Education Council of Western Australia.

**Appendix XXIII**  
**INCIDENCE AND MORTALITY OF NOTIFIABLE**  
**INFECTIOUS DISEASES**

Diseases Notifiable	1955			1956			1957			1958		
	Cases Reported	Amend. Diagnosis	Deaths									
Acute Rheumatism ....	39	39	(A) 8	21	21	(A) 3	27	27	(A) 4	21	21	3
Amoebiasis ....	2	2	1	7	7	....	4	4	....	1	1	....
Ankylostomiasis ....	1	1	1	1	1	1	....	....	....	1	1	....
Brucellosis ....	5	5	....	3	3	....	2	2	....	....	....	....
Chorea ....	4	4	....	1	1	....	1	1	....	1	1	....
Dengue Fever ....	....	....	....	....	....	....	....	....	....	....	....	....
Diphtheria ....	547	480	6	159	145	1	66	63	1	26	24	....
Dysentery (Amoebic) ....	7	7	1	9	9	1	6	6	....	1	1	....
Dysentery (Bacillary) ....	127	127	....	71	71	3	46	46	....	121	121	....
Encephalitis, Lethargic ....	....	....	1	2	2	1	2	2	1	....	....	....
Erythema Nodosum ....	....	....	....	1	1	....	1	1	....	2	2	....
Hydatid ....	1	1	1	....	....	1	....	....	1	....	....	....
Infantile Diarrhoea ....	30	30	(B) 9	48	48	(B) 8	23	23	(B) 13	12	12	(B) 22
Infective Hepatitis ....	254	254	7	181	181	4	363	363	3	396	396	1
Lead Poisoning ....	3	3	....	13	13	1	1	1	....	1	1	....
Leprosy ....	29	29	....	34	34	....	33	33	....	38	38	....
Malaria ....	5	5	....	6	6	....	2	2	....	2	2	....
Meningococcal Infection ....	13	13	4	13	13	2	6	6	5	9	9	2
Paratyphoid ....	4	4	....	....	....	....	3	3	1	2	2	....
Poliomyelitis ....	34	33	1	416	401	15	9	3	1	3	1	....
Pleural Effusion ....	12	12	....	5	5	1	6	5	1	5	5	....
Puerperal Fever ....	5	5	....	1	1	....	2	2	....	1	1	....
Purulant Ophthalmia ....	35	35	....	31	31	....	9	9	....	30	30	....
Rubella ....	227	227	....	85	85	....	550	550	....	3,059	3,059	....
Salmonella Infection ....	58	58	....	27	27	....	21	21	1	45	45	....
Scarlet Fever ....	69	68	1	57	57	....	120	120	....	191	190	....
Tetanus ....	9	9	5	15	15	10	4	4	3	11	11	4
Tetanus Neonatorium ....	....	....	....	1	1	....	....	....	....	....	....	....
Trachoma ....	1,470	1,470	....	280	280	....	656	656	....	364	364	....
P.T.B. ....	408	401	31	429	419	43	347	327	35	388	350	23
Other T.B. ....	39	39	2	43	44	3	32	32	1	27	24	4
Typhoid Fever ....	13	13	1	8	8	....	9	9	....	22	22	2
Typhus Fever ....	22	22	1	16	16	....	7	7	....	5	5	....

Deaths exclude full-blood aborigines.

(B) Gastro-Enteritis and Colitis (except ulceration) under two years and Diarrhoea of the new born.

(A) Rheumatic Fever.

## Appendix XXIV

### MATERNAL MORTALITY

Period							Average Live Births	Average Maternal Deaths	Average Rate
1901-1905	....	....	....	....	....	....	6,681	28·0	4·19
1906-1910	....	....	....	....	....	....	7,691	43·4	5·64
1911-1915	....	....	....	....	....	....	8,844	39·4	4·46
1916-1920	....	....	....	....	....	....	7,726	41·4	5·36
1921-1925	....	....	....	....	....	....	8,056	34·2	4·25
1926-1930	....	....	....	....	....	....	8,748	46·8	5·35
1931-1935	....	....	....	....	....	....	8,062	35·4	4·39
1936-1940	....	....	....	....	....	....	8,877	32·4	3·65
1941-1945	....	....	....	....	....	....	10,408	24·4	2·34
1946-1950	....	....	....	....	....	....	13,130	21·4	1·63
1951-1955	....	....	....	....	....	....	15,724	13·8	0·88

Year	Live Births	Deaths From										
		Puerperal Spticaemia	Other Puerperal Infections	Abortion		All other Complications of Pregnancy and of the Puerperal State		All Complications of Pregnancy and the Puerperal State				
		No.	Rate	No.	Rate	No.	Rate	No.	Rate	No.	Rate	
1943	....	10,481	2	0·19	1	0·10	3	0·29	17	1·62	23	2·19
1944	....	10,870	2	0·18	2	0·18	5	0·46	18	1·66	27	2·48
1945	....	10,672	....	....	2	0·19	5	0·47	13	1·22	20	1·87
1946	....	12,105	....	....	3	0·25	5	0·41	18	1·49	26	2·15
1947	....	12,874	1	0·08	1	0·08	8	0·62	22	1·71	32	2·49
1948	....	12,981	2	0·15	4	0·31	1	0·08	13	1·00	20	1·55
1949	....	13,511	....	....	2	0·15	3	0·22	11	0·81	16	1·18
1950	....	14,228	....	....	2	0·14	1	0·07	12	0·84	13	0·91
1951	....	14,794	....	....	2	0·14	3	0·20	11	0·74	16	1·08
1952	....	15,413	....	....	3	0·19	3	0·19	12	0·78	18	1·17
1953	....	15,862	....	....	....	....	1	0·06	8	0·50	9	0·57
1954	....	15,928	....	....	....	....	5	0·31	7	0·44	12	0·75
1955	....	16,623	....	....	....	....	1	0·06	13	0·78	14	0·84
1956	....	16,916	....	....	....	....	2	0·12	7	0·41	9	0·53
1957	....	16,924	....	....	....	....	3	0·18	8	0·47	11	0·65
1958	....	16,731	....	....	....	....	1	0·06	7	0·42	8	0·48

All rates per thousand live births.

## Appendix XXV

### STILLBIRTH AND INFANT MORTALITY RATES

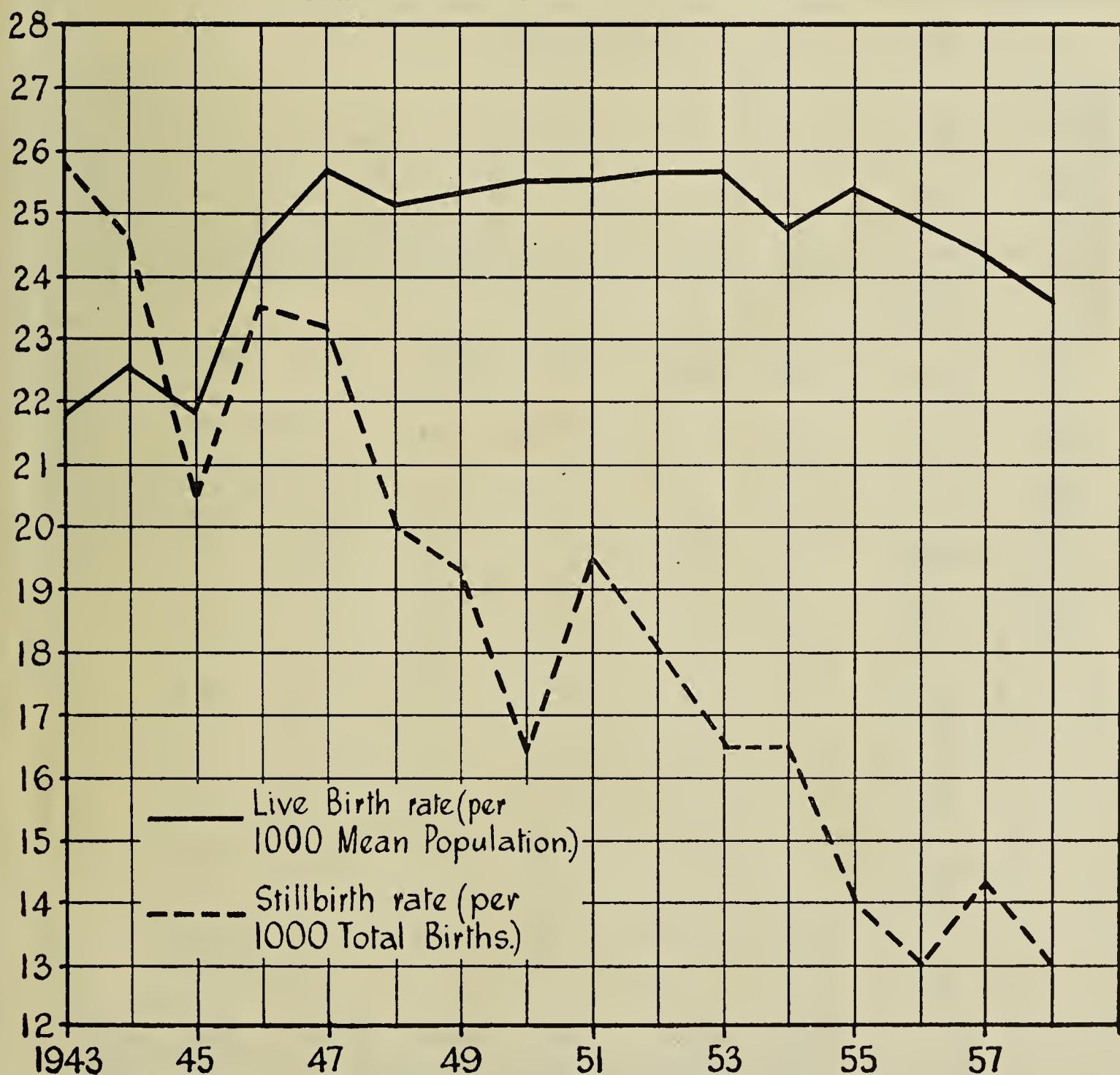
Year	Total Births including Stillbirths	Stillbirth Rates	Neo-Natal Rates.		Total Mortality Rates under One Year	Other Post Natal Rates Over One Month and Under One Year
			Under One Week	Under One Month		
1926	....	8,534	27.4	....	27.6	48.0
1927	....	8,708	26.0	....	23.0	44.7
1928	....	8,981	30.9	....	23.1	35.5
1929	....	9,316	28.4	18.8	25.8	54.6
1930	....	9,456	27.0	18.0	23.5	46.5
1931	....	8,777	26.0	20.1	26.6	40.5
1932	....	8,175	25.7	21.02	25.2	43.5
1933	....	8,105	29.4	18.1	22.5	35.8
1934	....	8,029	29.2	19.3	24.8	38.8
1935	....	8,377	30.8	20.6	24.8	39.0
1936	....	8,730	28.9	19.6	24.8	41.0
1937	....	8,850	27.2	16.8	21.2	36.5
1938	....	9,325	23.9	16.6	19.1	33.1
1939	....	9,249	23.0	16.5	19.7	40.0
1940	....	9,363	25.9	20.5	24.9	43.0
1941	....	10,375	24.6	15.1	18.1	34.4
1942	....	10,109	20.6	17.1	20.3	36.2
1943	....	10,759	25.8	17.1	21.0	31.8
1944	....	11,144	24.8	18.6	21.0	32.0
1945	....	10,896	20.6	18.0	20.0	28.9
1946	....	12,398	23.1	17.1	20.6	30.3
1947	....	13,178	23.2	16.9	19.4	30.2
1948	....	13,197	20.5	16.9	18.7	25.0
1949	....	13,779	19.4	16.2	19.0	25.9
1950	....	14,468	16.6	16.2	18.0	26.7
1951	....	15,091	19.7	16.2	19.7	28.2
1952	....	15,697	18.1	15.5	17.7	24.5
1953	....	16,130	16.6	13.4	16.2	23.4
1954	....	16,198	16.7	14.2	15.8	22.2
1955	....	16,862	14.2	13.3	15.8	22.1
1956	....	17,142	13.2	13.0	15.7	22.4
1957	....	17,169	14.3	13.6	14.9	20.8
1958	....	16,956	13.3	12.8	14.2	21.2

In above table all rates are calculated in deaths per 1,000 of total births, including stillbirths.

**Appendix XXVI**  
**WESTERN AUSTRALIA – STILLBIRTH AND BIRTH RATES**

Year	Mean Population	Live Births		Stillbirths	
		Number	Rate per 1,000 Mean Population	Number	Rate per 1,000 Total Births
1943	476,745	10,481	21.98	278	25.84
1944	481,498	10,870	22.58	274	24.59
1945	487,510	10,672	21.89	224	20.56
1946	492,771	12,105	24.57	293	23.63
1947	502,951	12,874	25.60	304	23.07
1948	514,621	12,931	25.13	266	20.16
1949	532,603	13,511	25.37	268	19.45
1950	557,878	14,228	25.50	240	16.59
1951	580,317	14,794	25.49	297	19.68
1952	600,615	15,413	25.66	284	18.09
1953	621,034	15,862	25.54	268	16.62
1954	640,140	15,928	24.88	270	16.67
1955	658,747	16,623	25.23	239	14.17
1956	677,317	16,916	24.98	226	13.18
1957	691,723	16,924	24.47	245	14.27
1958	705,600	16,731	23.71	225	13.27

WESTERN AUSTRALIA-LIVE BIRTHS AND STILLBIRTH RATES



**Appendix XXVII**

**MEAT INSPECTION FOR YEAR ENDED 31ST DECEMBER, 1958**

Number and Type of Animals Slaughtered	Carcases Condemned for—								Part Carcases Condemned for—								Organs Condemned for—									
	Tuber-culosis	Actino-mycosis	Piroplas-mosis	Caseous Lymphadenitis	Para-Typhoid	Trau-matic and Septic Conditions	Pleuro-Pneu-monia	Other Abnor-malities	Carcases Condemned Totals	Actino-mycosis	Caseous Lymphadenitis	Tuber-culosis	Arth-ritis	Other Abnor-malities	Part Carcases Condemned Totals	Actino-mycosis	Echino-coccosis	Pleuro-Pneu-monia	Tuber-culosis	Other Abnor-malities	Organ Con-demned Totals					
<i>Robb's Jetty (including Foggitt's)</i>																										
Cattle	23,091	26	...	29	...	...	52	7	33	147	24	...	1	2	30	57	538	6	72	...	98	1,399	2,107	...	...	
Calves	153	...	...	...	...	...	...	80	...	377	465	...	1	...	225	23	536	3,058	...	213	...	...	8,194	8,407	6	52,669
Sheep	183,405	...	...	...	...	...	...	52	...	142	367	...	...	...	1,526	125	...	...	...	...	...	9	52,660	52,669	...	...
Pigs	106,911	136	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
<i>Midland Junction (including Foggitt's)</i>																										
Cattle	68,600	93	16	29	...	...	116	2	109	363	806	...	9	140	16	243	16	1,051	...	...	...	...	...	...	...	
Calves	6,179	...	...	...	...	...	...	...	...	377	465	...	...	...	135	71	...	663	...	...	...	...	...	...	...	
Sheep	699,302	35	...	...	...	...	...	...	...	142	367	...	...	...	...	...	...	...	533	28	1,224	1,310	...	...	...	
Pigs	66,474	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	104	...	...	464	1	...	...	...	
<i>Kalgoorlie</i>																										
Cattle	3,593	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24	...	38	...	...	...	...	...	
Calves	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	109	...	...	...	...	...	...	...	
Sheep	41,394	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	31	3	...	...	...	...	...	...	
Pigs	2,747	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24	1	...	...	...	...	...	...	
<i>Perth Meat Markets</i>																										
Cattle	2,934	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	29	31	291	10	11	...	...	...	
Calves	19,140	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	290	10	108	108	6	...	...	...	
Sheep	633	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...		
Pigs	563	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6	...	...	...	...	...	...	...	
<i>Fremantle Meat Markets</i>																										
Cattle	546	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	14	14	...	...	...	...	...	...	
Calves	2,450	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	3	...	...	...	...	...	...	
Sheep	449	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
Pigs	132	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	
<i>*Country Districts</i>																										
Cattle	24,141	30	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	17	3	...	...	...	...	...	...	
Calves	11,354	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	127	130	...	...	...	...	...	...	
Sheep	172,047	13	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	24	34	...	...	...	...	...	...	
Pigs	13,431	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	
Totals—																		26	127	138	115	103	64	108	22	
Cattle...	122,905																	12	59	30	12	10	35	1,009	45	
Calves...	39,276																	13	12	12	11	11	11	1,355	21	
Sheep...	1,097,230																									
Pigs...	190,258																									

\* Country Districts include following centres :—Albany, Bunbury (†), Busselton, Colie, Dardanup (†), Geraldton, Harvey, Katanning, Manjimup, Merredin (†), Mandurah, Narrogin, Northam Road Board and Council, Wagin, Waroona (†).  
 (†) Operating for part year only.

## Appendix XXVIII

### REVENUE AND EXPENDITURE FOR THE YEAR 1958

REVENUE											
											£ s. d.
Licence Fees ....	....	....	....	....	....	....	....	....	....	....	85 5 0
Meat Inspection Fees	....	....	....	....	....	....	....	....	....	....	21,479 9 3
Fish Inspection Fees	....	....	....	....	....	....	....	....	....	....	845 2 10
Pathological Laboratory	....	....	....	....	....	....	....	....	....	....	3,177 15 4
Sanitation Refunds ....	....	....	....	....	....	....	....	....	....	....	267 10 9
Inspection of Plans (Septic Tanks)	....	....	....	....	....	....	....	....	....	....	16,361 11 10
Miscellaneous	....	....	....	....	....	....	....	....	....	....	1,919 0 6
Nurses and Midwives Registration and Examination Fees	....	....	....	....	....	....	....	....	....	....	2,419 4 8
T.B. Diagnosis (Generally)	....	....	....	....	....	....	....	....	....	....	473,773 1 5
T.B. Diagnosis—											£ s. d.
Wooroloo	....	....	....	....	....	....	....	....	....	....	27,985 10 11
Perth Chest Hospital	....	....	....	....	....	....	....	....	....	....	1,949 10 0
											<hr/> 29,935 0 11
Health Supervision Charges	....	....	....	....	....	....	....	....	....	....	140 0 6
Baby Patterns	....	....	....	....	....	....	....	....	....	....	15 10 0
Hospital Benefits—Lepers	....	....	....	....	....	....	....	....	....	....	181 16 0
Supplementary and Organisation Benefits—Lepers	....	....	....	....	....	....	....	....	....	....	166 12 0
Poliomyelitis After-care	....	....	....	....	....	....	....	....	....	....	487 8 0
Immunised Diphtheria	....	....	....	....	....	....	....	....	....	....	403 10 0
Infectious Diseases ....	....	....	....	....	....	....	....	....	....	....	9,705 5 2
Pesticide Registration	....	....	....	....	....	....	....	....	....	....	194 9 10
											<hr/> £561,557 14 0
EXPENDITURE											
Salaries (including Tuberculosis) ....	....	....	....	....	....	....	....	....	....	....	532,073 18 8
Infectious Diseases ....	....	....	....	....	....	....	....	....	....	....	23,781 12 5
School Medical Doctors and Nurses Travelling	....	....	....	....	....	....	....	....	....	....	3,552 14 11
Dental Bursaries	....	....	....	....	....	....	....	....	....	....	5,880 4 0
School Dentists Travelling and Expenses	....	....	....	....	....	....	....	....	....	....	5,778 19 9
School Medical and Dental Services, Other Expenditure	....	....	....	....	....	....	....	....	....	....	9,542 13 6
Travelling and Transport Generally	....	....	....	....	....	....	....	....	....	....	2,911 9 11
Travelling and Transport Commissioner and Medical Officer	....	....	....	....	....	....	....	....	....	....	673 11 4
Ophthalmic Survey	....	....	....	....	....	....	....	....	....	....	1,685 16 1
Postage and Telephones	....	....	....	....	....	....	....	....	....	....	1,262 4 3
Laboratory	....	....	....	....	....	....	....	....	....	....	13,151 10 7
Venereal Diseases	....	....	....	....	....	....	....	....	....	....	3,038 1 5
Infant Welfare Centres	....	....	....	....	....	....	....	....	....	....	89,975 3 9
Maintenance and Transport Lepers	....	....	....	....	....	....	....	....	....	....	28,757 19 8
Poliomyelitis	....	....	....	....	....	....	....	....	....	....	29,808 6 9
Sanitation Government Buildings	....	....	....	....	....	....	....	....	....	....	17,677 9 3
Health Education	....	....	....	....	....	....	....	....	....	....	3,984 7 5
Tuberculosis Clinics	....	....	....	....	....	....	....	....	....	....	269,221 10 9
Miscellaneous	....	....	....	....	....	....	....	....	....	....	16,546 4 2
											<hr/> £1,059,303 18 7





